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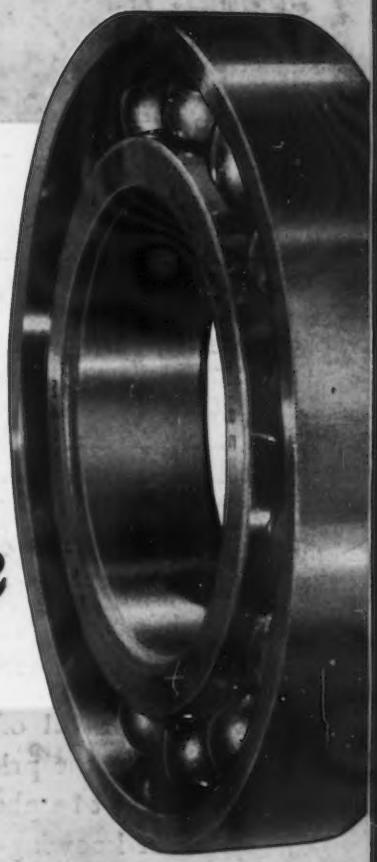

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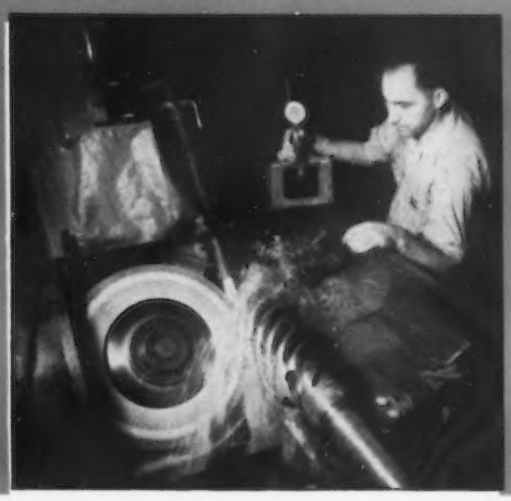

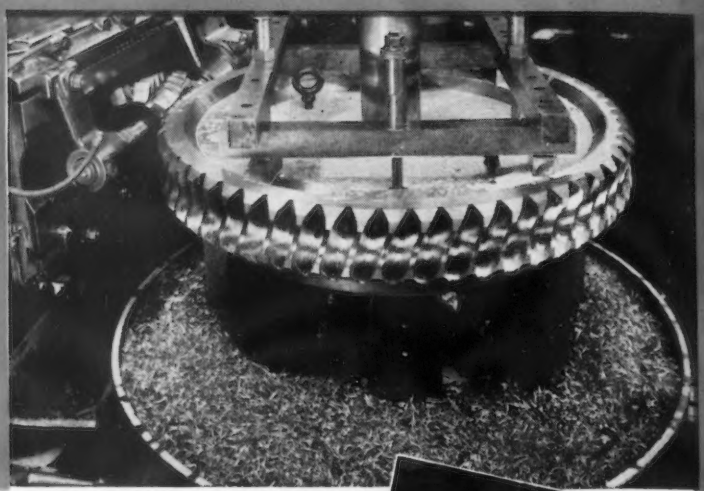

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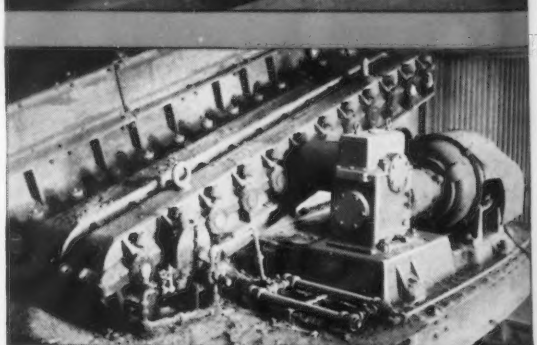

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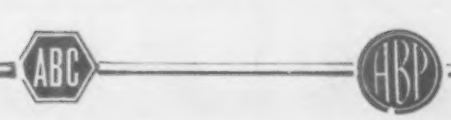

FOR QUICK ACTION ON STEEL

"WE'RE having better luck on steel, now," said a manufacturer the other day. "There *were* times when we had to 'phone and 'phone, but now we are going to the warehouse with the most complete stocks, with best facilities for handling and delivery. We are saving the time of shopping around—and saving man-hours in our plant—by calling Ryerson first."

Sound reasoning, isn't it, when you want something, to go where you're most apt to get it. Whether it's fast service, a steady, reliable source, a cutting or fabricating operation that will facilitate your production, or just information and assistance, you're most apt to get what you want by calling Ryerson first!

Ryerson has maintained its leadership in the steel business by making good every promise, by knowing the kind of service customers want and giving it to them, and above all else, by having *in stock* most of the time the kinds, shapes and sizes of steel they want, ready for immediate delivery.

Stocks are reasonably complete, considering the war demand placed upon them. But, whatever kind of steel you want, within the WPB plan; whatever service you would like to have, *call Ryerson first!* You'll get prompt, intelligent cooperation—at Ryerson!

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THE IRON AGE

APRIL 8, 1943

ESTABLISHED 1855

An Open Letter to Uncle Sam

Dear Uncle:

About two years ago, you found yourself in a jam. Hitler was overrunning Europe and threatening the invasion of England. Germany and Japan had been conspiring and conniving at world domination for more than 10 years and had millions of soldiers and mountains of munitions to back them up. And there you were practically defenseless, with no army to speak of and not enough guns, tanks, planes or ammunition to last a week in full scale combat, even if you had had the soldiers to use them.

You were blessed in natural resources. But you couldn't throw iron pigs or steel ingots at an invader nor repel him with lumps of ore. There was one industry in this country that stood between the raw materials and the finished engines of war. You called upon that industry for help and you got it. If it had not done what was next to an impossible job you would be behind the eight ball today; Russia would probably have been beaten by this time, and England would not be dropping block busters on Berlin.

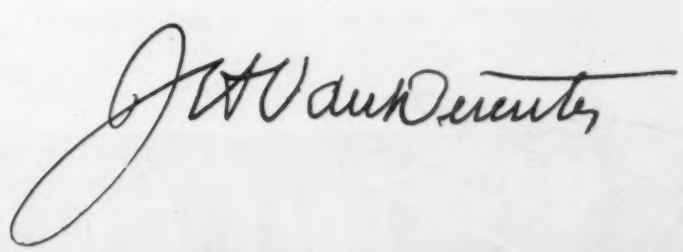
I refer to the machine tool building industry. You can't make an airplane, a tank, a gun, a tin can or a torpedo without first finding the machine tools with which to convert natural resources into munitions.

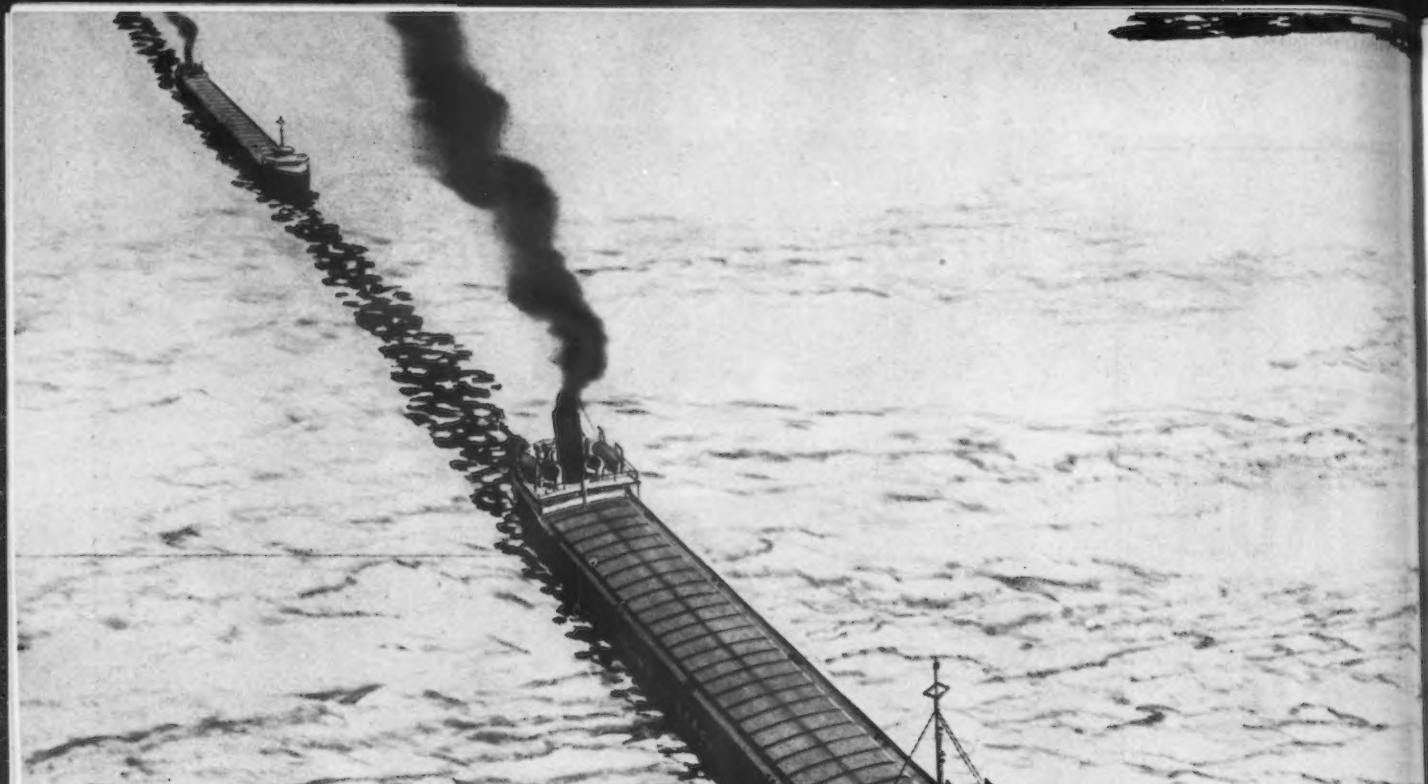
You have complimented this industry, rightly, on its performance. It has expanded itself more than eight times in productive capacity and because of this you now have all of the weapons on hand or in sight that you need to finish this job.

I think that you will admit, Uncle, that the machine tool builder is, of all our essential industries, probably the most essential in war and in peace. And I do not think that you want to or would intentionally put this extremely valuable industry on the scrap pile as soon as the war is over. But that is just what may happen unless you watch your step.

You have piled up huge inventories of machine tools of all kinds in your Defense Corp. plants, more than enough to satisfy all normal demands of machine tool users for several years of peacetime production. If, as the need for these tools lessens as the war proceeds, or when it ends, you throw these tools on the market you will kill this industry completely. Especially since through renegotiation you are preventing it from building surplus capital for maintaining after-the-war employment

You are not, I am sure, naive enough to scrap all of your tanks and guns and fighting planes after peace is declared. You will slush them with oil and keep them ready if a next time comes. Why then, scrap the industry that makes them possible?





Inland Freighters Battle Ice

Again Must Move Record Tonnages of Iron Ore

Since mid-March crews have been aboard ore carriers of the Inland Fleet—preparing for another long season and record tonnages of iron ore from the Upper Great Lakes Region.

Cargo holds have been cleaned, every piece of machinery overhauled, boilers repaired, pumps repacked, and the ships painted—everything made ready for the first trips into ice-filled lake waters.

Usually the season of navigation opens early in April and closes in late November. Last year the first Inland ships left Indiana Harbor March 25 and the last cargo of ore arrived on Dec. 13. The Fleet made an all-time tonnage record, and the *L. E. Block*, Inland flagship, established a new mileage record for such vessels by traveling 61,887 miles in 38 trips.

Iron ore shipments on the Great Lakes last year were twelve million tons higher than in 1941, and the tentative quota for this year is boosted to three million tons more than last. But if readiness of equipment and men is any indication, the Inland Fleet can be depended upon to carry its share of this huge tonnage in the busy season ahead.

Seamen on the Inland ships, like the Inland steelmakers, are fully aware of their important part in producing the "fighting steel" needed for Victory.

ARMY E NAVY

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Manufacturing the Light Carbine

. . . Detailed machining operations are published for the first time on three of the principal components of the latest small arm added to the weapons supplied the U. S. Army. Known as the U. S. carbine, cal. 0.30, M1, it is being produced by a leading manufacturer of sporting rifles on existing equipment, some of which dates back to 1875.

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By BRIG.-GEN. JAMES KIRK
Chief, Small Arms Branch, Ordnance Department

o o o

THE new methods of warfare soon revealed the need for a more accurate and longer range weapon than the old service pistol. On the other hand, this weapon had to be light, easy to manipulate and use small size ammunition so that a large number of rounds could be carried by the individual. Such a weapon is the carbine, a light semi-automatic developed at the request of the Ordnance Department of the U. S. Army. Many private concerns as well as the Ordnance Department's Springfield Armory, entered model guns for test and standardization. Of all the guns tested and proofed, the Army services involved selected the one now known as the U. S. Carbine, cal. 0.30, M1.

This new arm weighs about 5 lb., is less than a yard long, and is fed from a magazine holding 15 rounds. While of the same caliber as the Garand, the cartridges are only about half as long and the bullets are of approximately half the weight. The extreme range is in the neighborhood of 2000 yards, but this weapon is primarily designed for close quarter defense.

Semi-automatic or self loading, the gun is capable of delivering a large volume of accurate fire upon any designated point of area within range. Like the Garand, it is gas operated, that is, a portion of the gases liberated upon firing are led through a small aperture in the barrel into a gas cylinder underneath. The pressure is made to actuate an operating rod or slide which extends back to engage and operate the bolt. When the gun is fired, the rod and bolt are driven backwards, ejecting the empty shell. At the same time, a spring is compressed which then drives the bolt forward. During this forward movement, the bolt strikes against a fresh round of ammunition, which has been forced into place by the magazine spring, and pushes it into the chamber. Only a few degrees of rotation serve to lock and unlock the bolt, and this motion is produced by a cam recess on the operating rod. At the end of the cycle, the piece is cocked ready to fire at pressure on the trigger. We might state that it requires only a minor change in design to convert a semi-automatic to full automatic and vice versa.

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While the bolt and action of the carbine and Garand are very similar, there is a material difference in the gas cylinders. The gas cylinder of the Garand is close to the muzzle and is approximately the length of the bolt stroke. The forward end of the operating slide acts as a piston within this cylinder. On the other hand, the cylinder of the carbine is a short lug forged on the barrel close to the chamber and bored for a short piston which has a play of only about ⅛ in. The short operating rod of the carbine is separate from the piston but is held tight against it by a spring. The force

FIG. 1—U. S. carbine, cal. 0.30, M1.

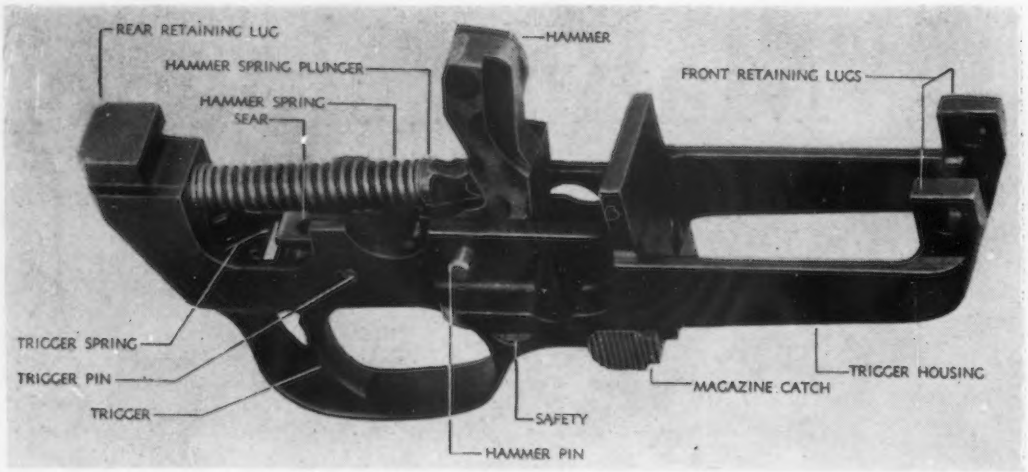

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FIG. 2—Trigger housing group of the carbine, cal. 0.30, M1.

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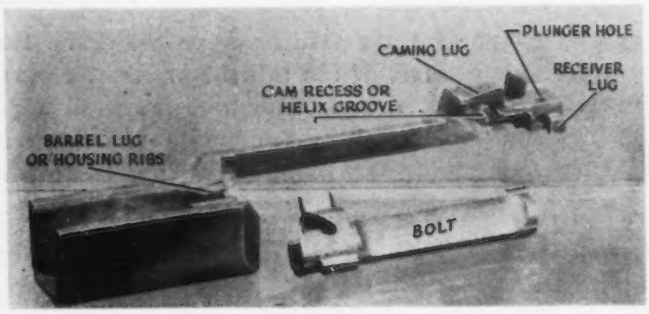
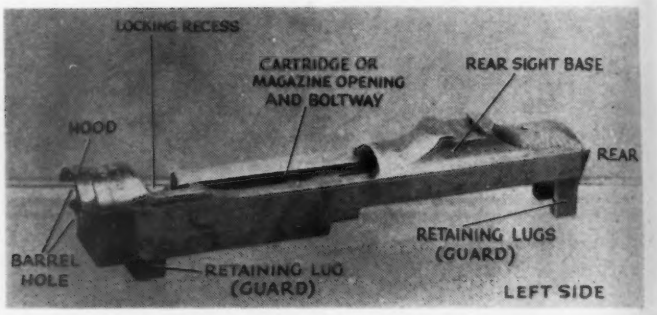
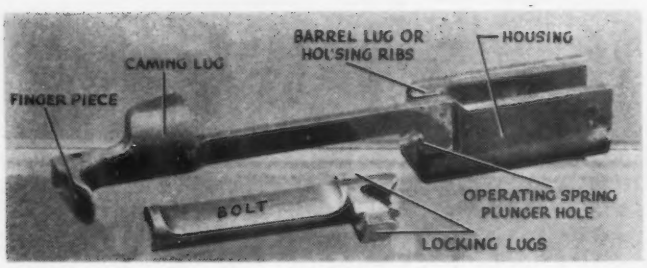
BELOW

FIG. 5—Right and left side views of the receiver, or main body of the carbine.







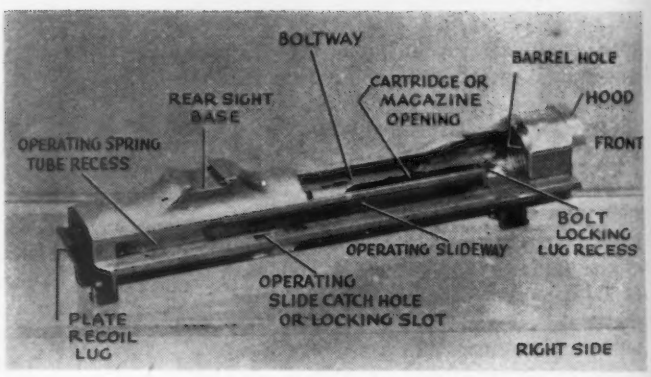
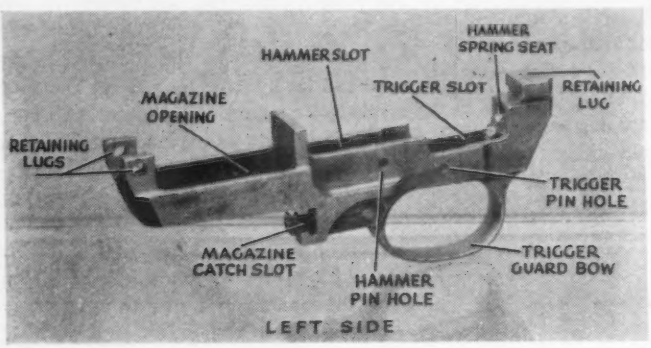


Fig. 3—Two views of the operating slide of the carbine.



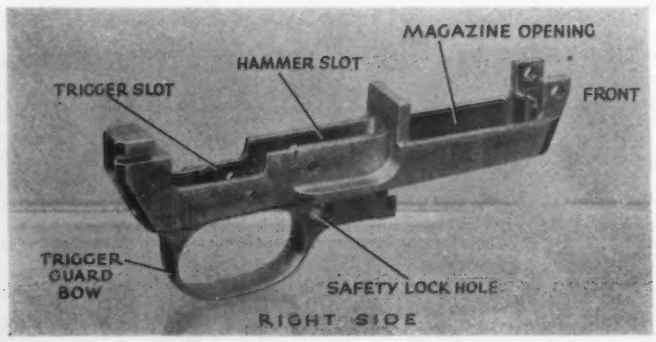


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FIG. 4—Right and left side views of the trigger housing.

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with which the piston is driven back by the pressure of discharge is sufficient to actuate the operating rod and bolt through the entire cycle, the return being by spring.

Simplicity Emphasized

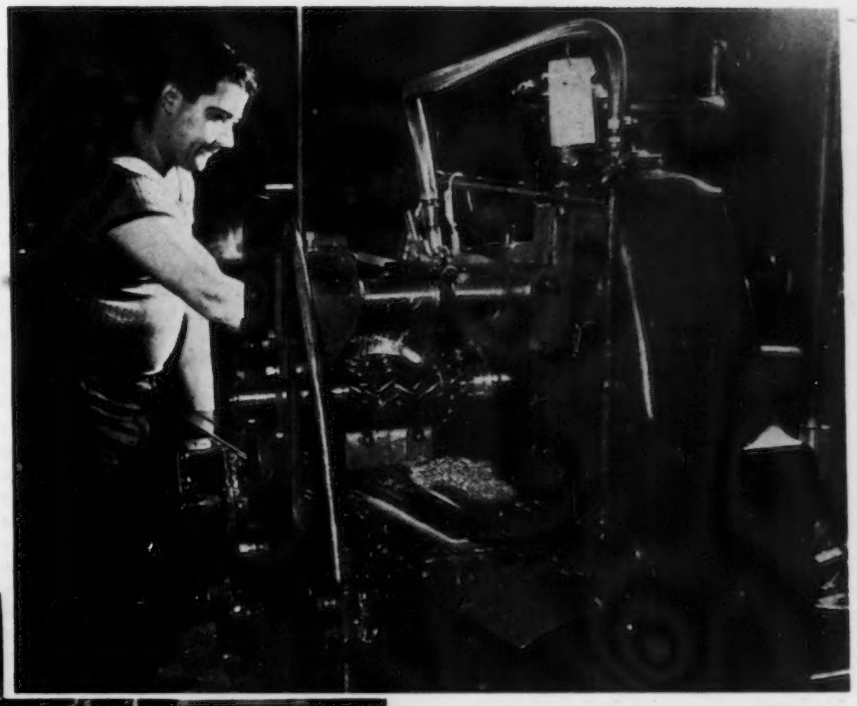
Simplicity in the design of a military weapon is vital, for the more parts there are the more machine operations necessary for production, and increased chances of malfunction in the field. The old manually operated Springfield has about 92 parts, the Garand semi-automatic has 72 parts, while the carbine semi-automatic has been achieved with only 62 parts including springs, screws and pins.

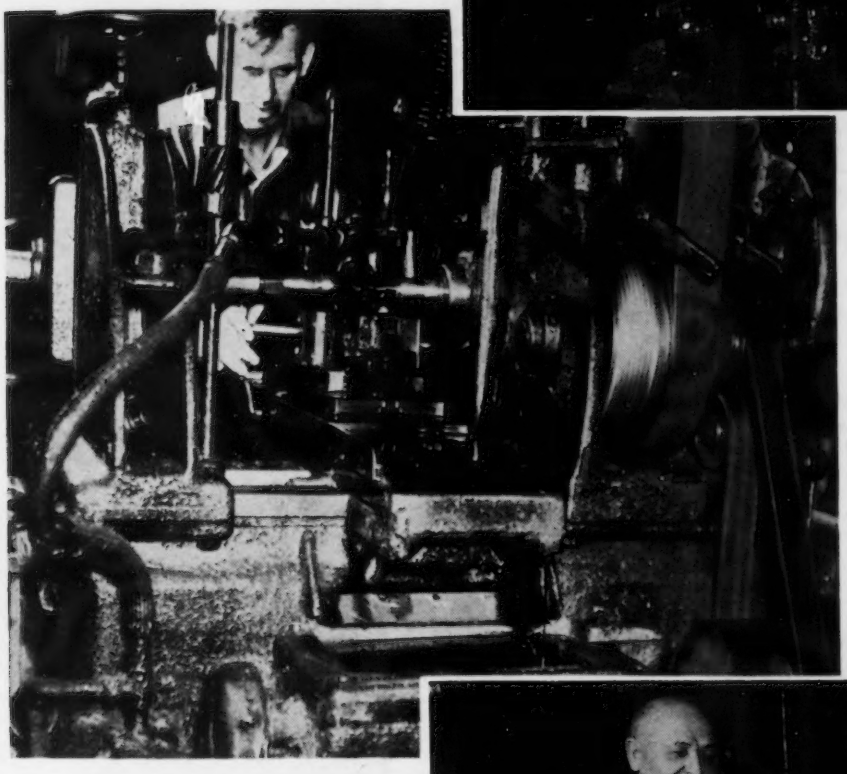
A number of the parts of the carbine are forged in a large forging shop and among these are the receiver bolt, barrel, operating slide, magazine

catch, extractor, hammer, trigger, trigger housing and firing pin. Drop hammers of various sizes are employed and slot type oil or gas fired furnaces are used for heating the stock. Many parts are forged from bar stock and three impression dies are standard at one plant. Forgings are annealed prior to machining in heat-treating furnaces of the batch type, fired with either oil or gas.

When one of the principal contractors started making the carbine it was already in production on the Garand, the trench gun, various sporting arms for training troops to shoot and all kinds of military ammunition. New machines were almost impossible to procure and machine tool makers had one or two years' backlog of orders. Undaunted, this company brought out old machines, some of them 60 and 70 years of age, built jigs, tools and fixtures in its own tool department and went to work mass producing the carbine. With but few exceptions, these machines are millers, profilers and drill presses, whose only modernization occurred 20 odd years ago when the millers were fitted with automatic returns in place of the hand feeds. Most of the milling machines, both heavy and light, were of the Lincoln type developed years ago for small arms manufacture. Each is fitted with from one to eight cutters milling as many surfaces simultaneously.

One interesting part of the carbine





ABOVE

FIG. 6—Gang milling operation being performed on a Brown & Sharpe electrically controlled miller.

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LEFT

FIG. 7—An old Lincoln type miller adapted for a formed milling or profiling operation.

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BELOW

FIG. 8—Special rocking fixture used for circle milling the receiver on a Van Norman hand miller.

TABLE I
Operations on the Carbine, Operating Slide

Operation	Machine
1. Rough straddle mill ends of housing and rough mill left side of bar and housing	B. & S. miller
2. Rough mill right side of housing and bar	B. & S. miller
3. Burr	Hand File
4. Rough mill top of bar and housing and rear end of finger piece	Miller
5. Burr	Hand file
6. Rough mill bottom of bar and housing, and rear end of housing under bar — crosswise	Miller
7. Finish mill bottom of bar and housing and rear ends of housing	Miller
8. Finish mill right side of bar and housing	Miller
9. Burr	Hand file
10. Finish mill top of bar and housing and rear end of finger piece	Miller
11. Finish straddle mill ends of housing and finish mill left side of bar and housing	Miller
12. Burr	Hand file
13. Mill radius on bottom of housing and bottom of bar lug (shoulder)	Miller
14. Mill 45 deg. angle on rear end of housing below bar lug	Miller
15. Mill 0.150 in. radius on rear end of housing at bottom	Miller
16. Mill 0.125 in. radius on rear end of housing at left side	Miller
17. Mill top of bar rear end of caming lug	Miller
18. Rough mill excess stock left side of bar (front of helix groove) lengthwise	Miller
19. Rough mill excess stock left side of caming lug	Miller
20. Finish mill left side of bar rear end and radius left side of caming lug	Miller
21. Handmill excess stock left side of bar, front of helix groove	Hand miller
22. Burr	Hand file
23. Mill slot in bottom of bar rear end at finger piece	Miller
24. Rough mill opening in top of housing — lengthwise — 1st step	Miller
25. Finish mill opening in top of housing — lengthwise — 1st step	Miller
26. Rough mill excess stock out of housing top — lengthwise	Miller
27. Rough mill opening in top of housing — lengthwise — 2nd step	Miller
28. Mill off excess stock on left side of housing, top rear end	Miller
29. Finish mill opening in top of housing — lengthwise — 2nd step	Miller
30. Burr	Bench
31. Rough out excess stock, from bottom of housing, with end mill	Miller
32. Circle mill radius, right side front of finger piece	Hand miller
33. Edge radius front of finger piece	Profiler
34. Edge radius back of finger piece	Profiler
35. Edge corner, top right side of caming lug	Profiler
36. Rough edge bottom of housing front of shoulder	Profiler
37. Finish edge bottom of housing and piston seat front of shoulder	Profiler
38. Edge undercuts right and left sides of housing rear end	Profiler
39. Rough mill helix groove	Hand miller
40. Edge helix groove rear section	Profiler
41. Edge helix groove front section	Profiler
42. Rough mill helix groove	B. & S. special cam cutting machine
43. Finish mill helix groove	B. & B. special cam cutting machine
44. Spline front of left barrel lug	Spliner
45. Handmill qualify piston seat	Hand miller
46. Handmill barrel shoulder clearance cut	Hand miller
47. Burr	Bench
48. Edge 0.350 in. radius right and left sides of ribs rear end	Profiler
49. Edge 0.05 in. radius top of guide lug	Profiler
50. Straighten	Bench
51. Drill plunger hole—large and small diameter, and endmill and drill spring hole	Drill press
52. Ream plunger hole — large and small diameter	Drill press
53. Drill slide spring guide rod seat pocket in housing rear end	Drill press
54. Stamp "W"	Bench machine
55. File and corner	Bench
56. Inspect	Bench

is the operating rod or slide, illustrated, which is forged from alloy steel. After heat treating and pickling they are cold trimmed in a crank press and restruck cold in a drop hammer. In the machine shop the operations listed in Table I are then performed.

To achieve the cam cut in the operating slide which engages the bolt lug so as to lock and unlock the bolt, a specially tooled Brown & Sharpe miller is used (Oper. 42 and 43). The work holding fixture is mounted on bearings so as to rotate through a vertical arc of some 35 deg. The position of the cutting tool spindle is stationary and the work is both rotated and traversed horizontally.

The trigger housing, illustrated, is a tedious, although not difficult, part to machine. This item is first forged to shape from carbon steel and then annealed. The complete list of machining operations is shown in Table II.

The main forging of any small arm is the receiver. It is the part to which most of the smaller units are

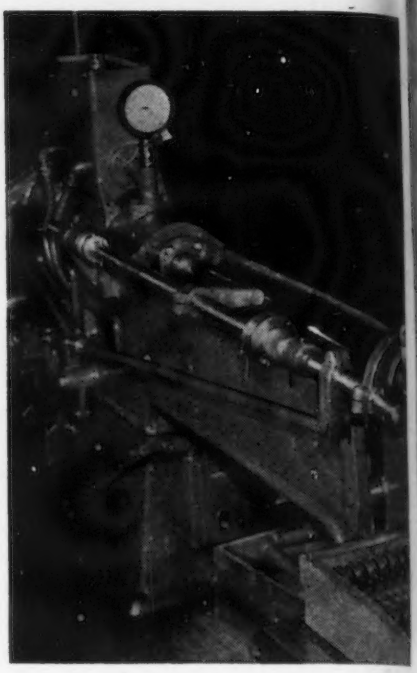

FIG. 9 — LaPointe hydraulic broaching opening in the

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attached. The complete list of operations on this interesting piece is given in Table III. As in the case of the operating slide and the trigger housing, there are a large number of

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FIG. 10 — Battery of Leland - Gifford being used to perform step drilling

machine being used to size the magazine trigger housing.

o o o

milling and profiling operations, as well as drill press work.

Drilling of the bolt hole lengthwise of the piece, operation 12, is somewhat out of the ordinary. Special Leland-

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electrically driven drills with hydraulic feed on a deep hole in the receiver.

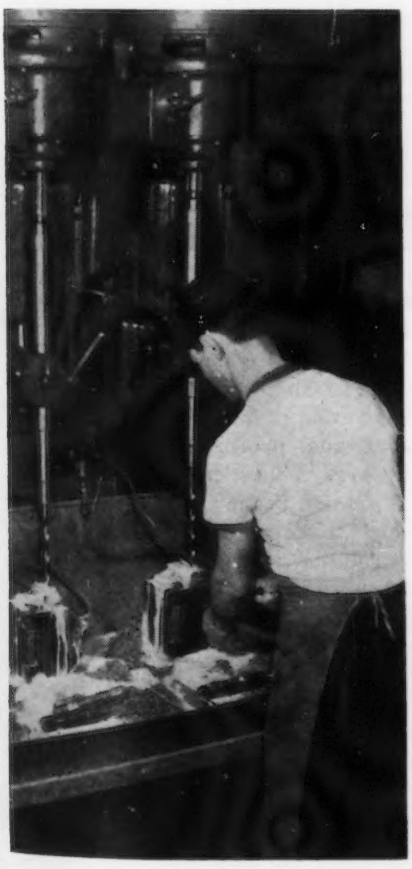

TABLE II
Operations on Trigger Housing

Operation	Machine
1. Surface grind both sides	Blanchard grinder
2. Demagnetize	Demagnetizer
3. Rough mill top and front end	Miller
4. Burr	Hand file
5. Rough mill bottom	Miller
6. Burr	Hand file
7. Finish mill top and front end	Miller
8. Burr	Hand file
9. Drill safety lock hole	Drill press
10. Ream safety lock hole	Drill press
11. Finish mill bottom	Miller
12. Burr	Hand file
13. Rough mill right side — rear	Miller
14. Finish mill right side — complete	Miller
15. Burr	Hand file
16. Rough mill left side rear	Miller
17. Finish left side complete	Miller
18. Burr	Hand file
19. Rough mill rear end	Miller
20. Rough mill single and radius — front end	Miller
21. Finish mill angle and radius — front end	Miller
22. Mill right side bottom rear of magazine opening	Miller
23. Burr	Hand file
24. Drill guard pin hole, magazine catch pin hole, hammer pin hole and trigger pin hole	Drill press
25. Finish ream guard pin hole	Drill press
26. Finish mill rear end	Miller
27. Mill 45 deg. angles at upper rear end	Miller
28. Rough straddle mill right and left sides of front guard lugs and central lug	Miller
29. Finish straddle mill right and left sides of front guard lugs and central lug	Miller
30. Burr	Hand file
31. Burr ream guard pin hole	
32. Mill magazine opening from bottom	Miller
33. Mill magazine opening from top	Miller
34. Edge excess stock from magazine opening	Profiler
35. Spline magazine opening front and rear ends	No. 3 Stiles-Bliss press
36. Broach magazine opening	LaPointe broaching machine
37. Burr	Hand file
38. Edge right side of guard bow	Profiler
39. Edge radius right side front of hammer pin hold	Profiler
40. Burr ream safety lock hole	Drill press
41. Edge guard bow left side	Profiler
42. Edge radius left side at safety lock hole	Profiler
43. Edge left side at hammer pin hole	Profiler
44. Burr	Hand file
45. Burr ream safety lock hole	Drill press
46. Drill clearance holes at front and rear ends of hammer and trigger slot	Drill press
47. Rough edge hammer and trigger slot	Profiler
48. Finish edge hammer and trigger slot, 1st depth	Profiler
49. Finish edge hammer and trigger slot, 2nd depth	Profiler
50. Edge trigger slot from bottom	Profiler
51. Drill and end mill clearance for front end of trigger	Drill press
52. Burr and ream safety lock hole	Drill press
53. Edge clearance for front end of trigger	Profiler
54. Burr ream safety lock hole	Drill press
55. Mill between guard lugs	Miller
56. Butt mill and drill trigger spring hole and guide rod hole	Drill press
57. Edge profile bottom of guard bow	Profiler
58. Edge inside guard bow	Profiler
59. Mill radius on rear end right and left sides	Miller
60. Drill, countersink, and butt mill plunger magazine catch retainer hole, two diameters	Drill press
61. Ream plunger magazine catch retainer hole	Drill press
62. Drill hole in bottom	Drill press
63. Burr ream safety lock hole	Drill press
64. Edge magazine catch cut	Profiler
65. Mill angle between guard lugs front ends	Miller
66. Edge assembling slots rear end, right and left sides	Profiler
67. Spline slot front of magazine opening	Horizontal spliner
68. Burr	Hand file
69. Spline bottom slot for magazine catch	Vertical spliner
70. Spline upper slot for magazine catch	Vertical spliner
71. Spline front of trigger slot	Horizontal spliner
72. Spline rear of trigger slot	Horizontal spliner
73. Hand mill two slots rear of magazine opening	Hand miller
74. Drill and ream hammer spring guide rod hole	Drill press
75. Ream guard pin hole, magazine catch pin hole, hammer pin hole and trigger spring hole	Drill press
76. Counterbore hammer spring seat	Drill press
77. Finish ream safety lock hole	Drill press
78. Burr ream plunger magazine catch retainer hole	Drill press
79. Stamp "W"	Bench machine
80. File and corner	Bench
81. Hand broach catch magazine opening	Bench
82. Inspect	Bench

Gifford drill presses are employed for this purpose. These are three-spindle machines, illustrated, with each spindle individually motor driven. The drill feeds are hydraulic and one motor and pump serve for a group of three. The drill pressure is about 80 lb. The principal feature of the set-up is an automatic pull-out after every 5/16 in. of drilling, that is, the drill is backed out to pull the drillings and is then returned automatically. When the hole is finished, the drill is backed out for good and stops automatically. Drilling this 6-in. deep hole requires about 4½ min., during which time the drill will relieve itself some 19 times.

Lard oil with soda is used for lubrication. At first, a full size drill was tried, but it left the surface of the hole too rough. Finally a slightly smaller drill was adopted and the hole reamed to size.

After drilling a chip clearance hole in the bottom, the main hole is rough and finish reamed in a four-spindle Allen drill press. One end of the hole is then double counterbored, or counterbored in two steps, to give clearance to start a tap for an internal tread. During these operations, the part is held upright in leaf-type jigs.

Assembly Procedure

In the manufacture of sporting arms during peace times, all the parts for each gun are collected and individual craftsmen accomplish the entire assembly from smallest part to complete gun. Today, assembly lines have been established, similar to those developed in the automotive industry, and the gun is put together part by part as it passes from hand to hand. For instance, one man now puts on the front sight and nothing more. He first drives a key into a slot cut in the barrel close to the muzzle and then forces a closed band holding the sight onto the barrel and pins it to the key.

Another operator puts the piston into the gas cylinder and screws in the piston lock nut. The piston has a head and while free to move back and forth in the cylinder, the head and lock nut maintain the piston in place. The head also acts as a seal to keep the gases from leaking back through the lock nut joint. Still another operator screws the barrel and the receiver together. As the barrel holds the front sight and the receiver the back sight, both must be in perfect alinement. To accomplish this, two indicator uprights are employed, one on the barrel and one on a two-handle wrench on the receiver. A part of the last turn, in screwing the two parts together, forces the threads into a tight fit.

TABLE III

Operations on the Carbine Receiver

Operation	Machine
1. Surface grind right and left sides	Blanchard grinder
2. Demagnetize	
3. Mill front end	Miller
4. Spot mill top	Miller
5. Rough mill bottom and angle rear end	Miller
6. Finish mill bottom and angle rear end	Miller
7. Rough straddle mill guard lug, front end	Miller
8. Finish straddle mill guard lug, front end	Miller
9. Rough straddle mill assembling lug, rear end and center	Miller
10. Finish straddle mill assembling lug, rear end and center	Miller
11. Burr	Hand file
12. Drill bolt hole	3-spindle Leland-Gifford drill press
13. Drill chip clearance hole in bottom	Drill press
14. Burr	Bench
15. Rough ream bolt hole	Drill press
16. Ream bolt hole, counterbore hole and counterbore minor and major diameters of thread	4-spindle Allen drill press
17. Counterbore barrel seat	Drill press
18. Edge front face, lower portion	Profiler
19. Mill radius, right side and rear end	Miller
20. Rough mill top	Miller
21. Finish mill top	Miller
22. Burr	Bench
23. Rough mill right side lengthwise (two at a time)	Miller
24. Finish mill right side lengthwise (two at a time)	Miller
25. Rough mill right and left sides of sight base	Miller
26. Finish mill right and left sides of sight base	Miller
27. Mill cartridge opening from top	Miller
28. Mill magazine opening from bottom	Miller
29. Mill underside of bolt way rear end	Miller
30. Rough circle handmill radius top of hood, front end	Hand miller
31. Finish circle hand mill radius top of hood, front end	Hand miller
32. Rough circle hand mill radius top, front end	Hand miller
33. Finish circle hand mill radius top, front end	Hand miller
34. Edge left side of cartridge opening	Profiler
35. Edge bevel right side of cartridge opening	Profiler
36. Edge bolt way, left side	Profiler
37. Finish edge front end of bolt way, left side	Profiler
38. Rough edge excess stock in magazine opening from bottom	Profiler
39. Burr	Bench
40. Spline rear of cartridge opening	P. & W. vertical spliner
41. Spline locking cut, right side	Spliner, P. & W. vertical
42. Spline corner top of right locking lug	P. & W. vertical spliner
43. Spline locking cut, left side	P. & W. vertical spliner
44. Edge operating slide slot	Profiler
45. Finish edge front end of operating slide slot, and operating slide release slot	Profiler
46. Edge slot bottom of operating slide slot	Profiler

Reclaiming Porous Castings

WRITING of Bakelite plastics and sealing solutions for the reclamation of porous castings, W. Bowman in a recent issue of *Foundry Trade Journal* points out that sealing solutions Bakelite V.1845 and N.2106 can be used.* The former is a clear solution of a special resin, and is used in cases of fine porosity, whereas the latter is a solution containing a finely divided mineral filler and is employed when the porosity is of a grosser nature. These solutions may be used for both ferrous and nonferrous metals, and factory trials have demonstrated conclusively that the results produced are highly satisfactory.

There are two main methods, one for small castings, by which the sealing solution is forced into the casting by external pressure, and the other, for large hollow castings, by which the solution inside the casting is subjected to pressure, thereby forcing the solution through the walls from the interior. The small castings can be treated by the well-known vacuum-pressure process, in which the castings are placed in a strong container from which the air can be evacuated. When a suitable vacuum has been attained, the sealing solution is allowed to run in from the storage vessel until the castings are covered, after which pressure is exerted for a con-

** The American equivalents are BV1845 and BE2106, sold by Bakelite Corp., 30 East 42nd St., New York.—Ed.*

Operation	Machine
47. Edge dovetail for rear sight	Profiler
48. Circle mill bevel top rear of barrel hole	Hand miller
49. Mill clearance cut for bolt lug, on left locking lug	Hand miller
50. Edge step left side, rear, from bottom	Profiler
51. Edge out bottom, rear end	Profiler
52. Burr	Bench
53. Edge left side rear, below bolt hole	Profiler
54. Finish edge rear end of bolt way from bottom	Profiler
55. Edge assembly cut for bolt, right side, rear from bottom	Profiler
56. Drill guard assembling pin hole and drill operating slide catch hole	Drill press
57. Mill operating rod slide catch hole	Hand miller
58. Edge clearance cut rear of magazine opening	Profiler
59. Burr	Bench
60. Mill clearance, rear of guard lug	Hand miller
61. Edge cartridge guide cut, right and left sides	Profiler
62. Edge cartridge guide cut, front	Profiler
63. Burr	Bench
64. Edge profile, top, rear end	Profiler
65. Edge radius top rear end	Profiler
66. Burr	Bench
67. Straddle mill right and left sides of plate recoil lug	Miller
68. Straddle mill top and bottom angles of plate recoil lug	Miller
69. Edge slot for guard, rear end	Profiler
70. Burr	Bench
71. Mill clearance cut for left bolt lug	Hand miller
72. Mill top of lug, rear end	Hand miller
73. Mill bolt lug clearance on bridge	Hand miller
74. Spline cartridge leading cut	Special horizontal spliner
75. Mill cartridge leading cut	Hand miller
76. Mill 45 deg. angle corner of clearance cut, front end, right side (upright cut and horizontal cuts)	Hand miller
77. Mill clearance cut for liner hand guard	Hand miller
78. Ream and countersink guard pin hole	Drill press
79. Mill clearance cut at right side, front lug	Hand miller
80. Spline retracting cam cut	P. & W. horizontal spliner
81. Qualify rear of bolt hole	Reed lathe with slider base
82. Stamp draw line	Bench
83. Machine and hand tap barrel hole and gage for draw line	Tapping machine
84. Qualify locking shoulders	P. & W. vertical spliner
85. Rough mill clearance for operating spring tube — lengthwise	Miller
86. Edge clearance cut for operating spring tube — entire length	Profiler
87. Butt mill and drill hole for operating spring tube plug (from rear)	Drill press
88. Counterbore seat for operating spring tube plug (from front)	Drill press
89. Edge corners at lower right side, rear end	Profiler
90. Mill slide operating locking slot	Hand miller
91. Form notch for tube, operating slide spring	Power press
92. Burr ream bolt hole	Lathe
93. Burr and corner	Bench
94. Inspect	Bench
95. Roll inscription "U. S. Carbine. Cal. .30, M1" on top, front end	Bench
96. Roll inscription of maker on top, rear end	Bench
97. Stamp serial number on top, rear end	Bench

With Bakelite V.1845 and N.2106

venient time. The solution is thus squeezed into the body walls of the casting, filling the pores. After removal from the vacuum-pressure chamber, the castings are submitted to a baking operation.

In the case of larger hollow castings, an example may be taken of one having several outlets. All but one of these apertures are closed, the open one being used as a port for filling the casting with the sealing solution and as an opening through which pressure may be exerted. The casting may be either in the trimmed or untrimmed condition, since final machining can be carried out after sealing, if desired. When the remaining exits of the casting are effectively plugged and the hollow casting is filled with the sealing solution, air pressure is applied at the open port, so that the solution is forced from the interior into the pores of the metal.

Any available pressure from 50 up to 250 lb. per sq. in. may be used. If any porosity exists, the solution is forced through so that sweating occurs on the outside surface of the casting; although in the case of gross defects the solution emerges as a spray. While it is probable that a casting showing such leaks would be returned to the foundry, it may be stated that even severe porosity can be cured by two impregnations of the solution N.2106, followed by intermediate stoving.

By this impregnation process, which is carried out at normal atmospheric temperature, some of the sealing solution remains within the walls of the casting; the next step is to "fix" it therein. The solution consists chiefly of a Bakelite synthetic resin which, by the application of heat, is converted from a soluble and fusible substance into a solid which is no longer soluble or fusible, and which is highly resistant to nearly all forms of attack. This transformation is known as polymerization, and Bakelite in this cured condition has no known solvent. The first stage of the baking process removes the solvent, and further heating leaves the pores of the casting filled with a chemically inert solid which cannot be removed by any pressures applicable to the casting in service or on test.

In order to effect this polymerization, the following procedure is adopted, although much latitude is permissible:

(1) After the pressure has been exerted for some time as is considered necessary, the casting is drained and lightly wiped with a cloth moistened with a thinning solution in order to remove the excess of material adhering to the surfaces of the casting. This is advisable because, after stoving, the hardened Bakelite adheres strongly and would be difficult to remove except by machining or hand-tool work.

(2) The casting is now placed in a suitable oven, well ventilated, at ordinary atmospheric temperature. Heat is applied so that during the first hour the casting is brought to a temperature of about 85 deg. C (185 deg. F.).

(3) After the solvents are removed, the temperature is raised to about 110 deg. C (230 deg. F.) for an hour and finally raised to 135 deg. C. (275 deg. F.) for a similar period.

When the stoving cycle is complete, the casting is sometimes refilled with sealing solution and again subjected to pressure. This second impregnation will test whether all the pores are filled; if any sweating can be observed, the casting is ready for a second stoving, which, however, is seldom required.

It will be noted that the castings have not been subjected to the usual hydraulic test; nor is this necessary, since the sealing solution itself acts as a pressure test medium which will detect any porosity and at the same time will charge the metal with the filling fluid, thus effecting a great saving of time. In fact, water must not be used; or if it were used as a test liquid, the casting must be dried thoroughly before the solution is placed therein. Of course, after the process of impregnation and stoving has been completed, the usual hydraulic tests may be carried out.

Production Short Cuts

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ABOVE LEFT

Baskets of sheet metal parts, each bearing the inspector's stamp of approval, are slid on a gravity conveyor and rolled to a point where they are picked up by an overhead electric crane.

o o o

LEFT CENTER

The overhead crane picks up six baskets at a time. A single operator controls the crane by push-button.

o o o

LEFT

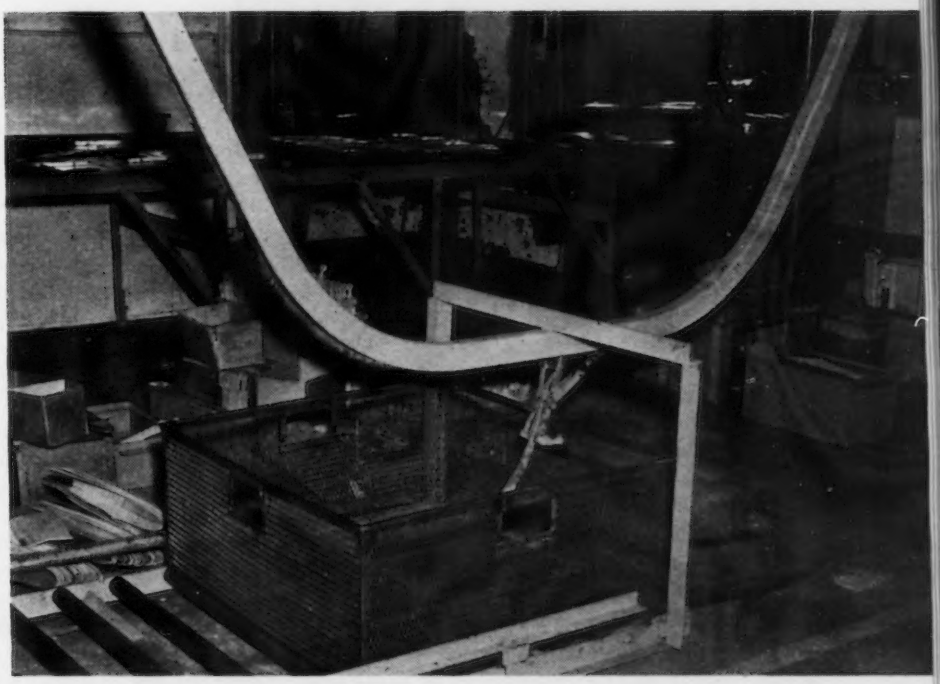
The overhead crane entirely handles the parts through the sequence of chromic acid cleansing operations, raising and lowering them into the vats, as shown here. The conveyor's efficiency has effected a 100 per cent increase in vat capacity.

A CONVEYOR for mechanical handling of all sheet metal parts from inspection to the prime paint conveyor line has been developen by Vultee Aircraft, Inc., Downey, Cal. This continuous process has cut the handling of parts from five times to twice and has increased the capacity of the chromic acid tank by 100 per cent.

o o o

ABOVE RIGHT

After the cleansing operations, the baskets of sheet metal parts are lowered on the gravity conveyor adjacent to the prime coat line. They then roll to work stations where, as shown above, they are shunted into position for transfer of the parts to the swiveled trays of the powered paint line.



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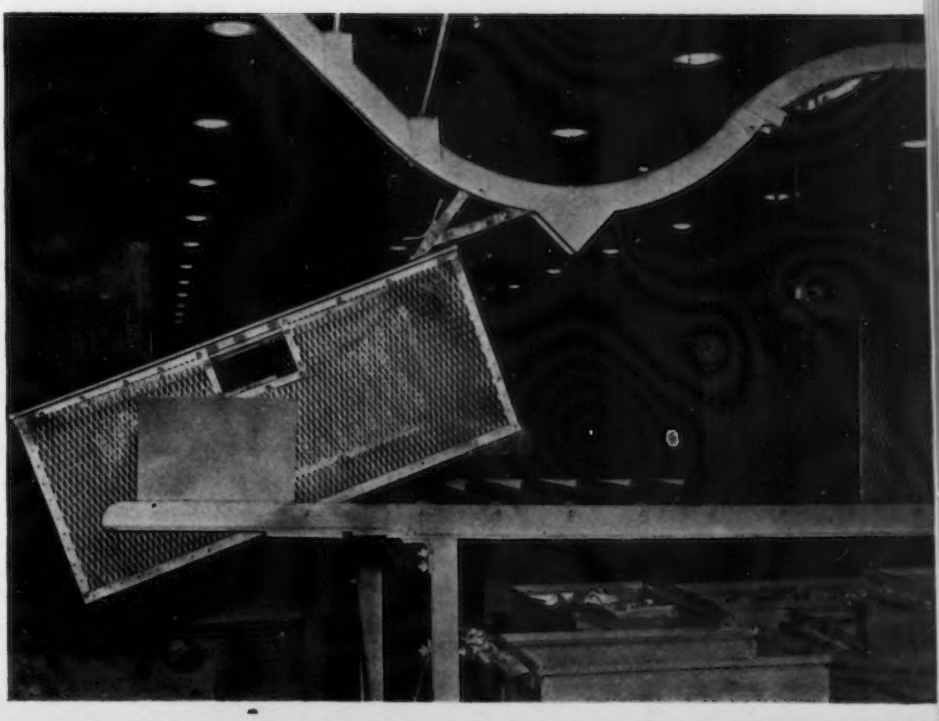
RIGHT CENTER

The empty baskets, tripping a lever, slip to the lower section of the roller conveyor. As they roll by gravity to the end of the line, they are picked up by special conveyor, as shown above.



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RIGHT

Carried overhead, the empty baskets are returned to the main sheet metal inspection station, where they are lowered to the start of the gravity line and released by an automatic trip, ready for their next journey with parts.

Plastics in Aircraft

WITH the enthusiasm of a young industry some plastics engineers do not concede to metals any part of a plane except perhaps, the motor, and not all of that. This is perhaps an extreme viewpoint, but it would be unwise to go on record against such possibilities at some future date.

At the present time there is, however, a great deal of interest in the suitability of plastic bonded materials for primary structural parts of aircraft. The existing shortage of metals has stimulated a swing to less critical materials, and much investigation of substitutes is now under way. In many cases the aircraft designer probably regards this as just another headache, and looks forward to the day when it will no longer be necessary. Others, however, feel that the inherent property of low density is a structural advantage which is basic, and not obtainable in any other material field. They look confidently to the research laboratories to cure the ills which have discouraged so many, and stopped entirely some ambitious attempts to substitute plastics for metals.

The writer has been asked for his opinion on the subject. This is a fair question but very few realize how involved it is. At first thought it seems easy to select the most suitable material for aircraft structures on the simple promise of strength-to-weight ratio. Unfortunately, the problem is not that simple. The fact is conceded that tensile and compressive strength is important, but the ultimate value of a material is based not on one property, but on the integration of all properties.

In comparison with available metals, plastics have definite advantages; and at present, at least, just as definite deficiencies. As mentioned previously, low density gives to the plastics structural superiority in many applications, and particularly in monocoque and semi-monocoque structures where strength against buckling is important. On the other hand, there are some cases where the lower densities of plastics are a disadvantage—where limitation of size is necessary from the standpoint of aerodynamic efficiency, and where design restrictions impose a limitation in overall dimension.

Continuing this comparison, the important factor of fabrication must be considered. In conventional designs weight is necessarily added at joints and fastenings, and aerodynamic efficiency is decreased by external riveted construction. Plastics may some day prove to have fabrication advantages, but so far the close control required to obtain a sound cemented joint and the relative brittleness of most of the structural plastics have proved disadvantageous. Also, it is not safe to assume that metal structural design will remain at its present stage of development while the plastics industry catches up and passes on.

Temperature Changes Severe

Another serious consideration which faces a new structural material is that of uniformity. For example, consider the case of sand castings in metal as compared with forgings. Even if the strength of sand castings under ideal conditions is as great as that of forgings, the fact that castings are comparatively lacking in structural uniformity would necessitate their use with a higher factor of safety. This acts as a weight penalty against their use. In other words, it is necessary to design for the lowest possible strength obtainable in actual production. This is where a new material, requiring new manufacturing and fabricating technique, is at a serious disadvantage. Allowance has to be made for the probable difference between the properties of ideal test sections made under laboratory conditions with skilled help, and the complicated shapes contended with under less favorable conditions with less skilled help in actual production. Usually practical experience is necessary to determine what these allowances must be.

In the case of plastics and plastic cements, attention also must be directed to the effects of aging. Some times artificial aging will give much of the information required, but no positive indication is assured until tests have been made over a period of time, which is a profound misfortune under present conditions, when time is of utmost value. Perhaps the greatest enemy to the use of plastics in aircraft structure is the wide temperature range which is encountered under actual flying conditions. Temperatures from —100 deg. to +165 deg. F. break down some plastics and adhesives completely and cause gradual disintegration of others. The lower temperatures make some otherwise superior plastics too brittle, and other useful ones become too soft at the higher end of the scale. Practically all are affected to some degree, and again the necessary factor of experience rises to the disadvantage of plastics.

Provision also must be made against dimensional instability under constant load which sometimes causes cold flow and which is aggravated by varying temperatures, especially in the higher range.

Reviewing these considerations you will see that a new material is penalized with a high factor of safety until it is known for certain that it will do the job under the worst possible conditions and over a considerable period of time. Until a comparatively recent date there have been other disadvantages associated with extensive use of plastics for major structural parts. The problem of applying the high temperatures and pressures ordinarily required to large and complicated members has been nearly insurmountable. Only recently have developments uncovered a new group of plastics combining interesting physical properties with low pressure setting properties.

Before leaving structural considerations, some mention must be given to the many so-called plastic planes in which synthetic resins have been used as a plywood bond. The developments are most interesting and valuable, but except for the adhesives used, are not greatly different in principle from those developed by

Construction

By JOHN K. NORTHROP
President, Northrop Aircraft, Inc.

Lockheed over 20 years ago, where pressure was applied to plywood strips cold-bonded by casein glue, to produce a beautifully molded plywood structural member having compound curvatures and considerable resistance to moisture. The newer resins are undoubtely more weather-proof than the first casein glues, but hardly enough to warrant all the publicity. The writer recently had an opportunity to examine a Lockheed Vega molded plywood fuselage which was 15 years old, and still in very good physical condition. It would seem that 15 years would be a good life expectancy for any machine, be it automobile, motor boat or airplane. Certainly, obsolescence sets in long before an airplane is 15 years old.

All this may sound discouraging from the standpoint of a true plastic airplane, but it should not be concluded that the problems cannot be solved eventually. They are problems of chemical research, and the science of chemistry boasts a history of achievement that should make any intelligent person afraid to say, "It cannot be done." In fact, these problems will likely be solved in time, and post war planes may use structural plastics to a great degree.

So far the discussion has dealt with primary structural parts, but the largest field of plastics in aircraft to date, and a field that is very attractive, lies in accessories and the thousand and one minor parts of varying importance that go to make up a modern airplane. Their number is legion and is being added to at a rate limited only by the ability of the plastics industry to tool and produce.

Extensive Secondary Use

Undoubtedly the most important secondary use of plastics in modern aircraft is in the transparent semi-structural members widely used in cock-pit enclosures, windows, turrets and gun emplacements. In such fields there is no competition with plastics, lucite and plexiglass, as well as some of the newer transparent resins such as those developed by Dr. Muskat. All have won their place through sheer merit. They are indispensible in modern aircraft design, and their basic usefulness has been greatly augmented by resourceful development of forming and cementing techniques which enable the designer to draw up transparent structures of almost any size and shape, with the assurance that they can be made by the industry. Forming techniques which maintain good optical qualities are an invaluable contribution to the efficiency of aircraft, as they enable the designer to maintain adequate vision with little or no sacrifice in aerodynamic form. Each new airplane carries a new and larger transparent bubble covering some gun emplacement or sighting station, and no doubt some day the 15-in. guns of the coast artillery will be comfortably housed in a transparent enclosure as big as the dome on Mt. Palomar.

From transparent enclosure on down, almost everything in an airplane has been or could be formed of plastic materials. Control wheels, control handles, seats, floors, window frames, trim tabs, pulleys, and pulley brackets, ammunition boxes and chutes, electrical apparatus, landing wheels and fuel tanks, are only a few of the many necessary items in which plastics have been used with success.

One of the organizations that has been especially active in the use of plastics is the Glenn L. Martin Co. who have carried on extensive research on the subject for several years. They have made quite large assemblies, some in the primary structure, with evident success.

Another use in which plastics appear better than metals on their own merit is in the construction of bullet-proof fuel tanks, or in compartment linings where such tanks are to be housed. In such locations the fact that bullets may pass through the material without cracking, bulging or "flowering" the structures, is of very great advantage.

One of the most important uses in aircraft is in connection with the extensive electrical system which is a necessary part of modern war planes. Here radio masts and cases, antenna housings, junction boxes, switches, relays, and a thousand other gadgets are better parts because they are molded plastic. A recent interesting development having wide possibilities is in connection with the gun installations. Here ammunition boxes, feed and ejection chutes, ammunition rollers, access doors and gun controls all may be made as well or better from fiber or plastics than they can of metal. As such use largely replaces stainless steel, which is a highly critical war material, it is doubly valuable.

Most interesting have been the recent applications of plastic parts to airplane engines. Complicated cooling baffles, push-rod housings, electrical harness supports, and similar parts have been developed which prove to be durable in service, and lighter in weight than the metals they replace, and so do their part in releasing thousands of pounds of critical metals for service where no substitute can be found. It is possible to go on indefinitely with a list of this sort and still not cover all the places where sheer merit has warranted the use of plastic parts in aircraft or aircraft accessories. Enough has been said, however, to indicate that the field is virtually unlimited except by the engineering time and brains available for such developments.

If plywood structures bonded with synthetic resins are eliminated—which should be done, as calling such planes plastic is surely a misnomer—it is the writer's considered opinion that a plastic having all the qualities necessary in a major structural member, is just now emerging from the chemist's test tube, if in fact it has yet emerged. On the other hand, only a comparatively small portion of the total gross weight of an airplane is basic structure, or power-plant, and everything else, including the pay load, can well be a product of this amazing infant industry that has grown almost over night out of a bottle to the proportion of an industrial giant.

Training Welders for

. . . The author pleads for closer cooperation between schools and industry and for more practical training and qualification procedure. He details what equipment schools should have and indicates the best procedures for either plant or outside schools.

o o o

By JOSEPH V. KLIEB
Welding Engineer, Easy Washing Machine Co., Syracuse, N. Y.

o o o

WANTED: Qualified welders who have a working knowledge of all types of welding electrodes; welding techniques and procedures; must understand expansion and contraction, preheating, effects of peening; be acquainted with existing codes. In addition, a working knowledge of hand and automatic burning, an understanding of welding symbols, chipping and caulking, and layout work. Ability to read blueprints would be useful.

Yes, this is the type man every employer would like to employ, but where can such men be found? At present and probably before this present emergency, a welder of this sort would be very hard to locate, but in the future the above "wanted" advertisement will be the requirement for welders and we shall have them, too, because the young welder of today is being taught these things, and furthermore the welders realize these requirements will be necessary in order to hold any job after this crisis is over.

Let's just go back 15 or more years, before the organization of welding schools throughout this country. The welders at that time did not always have the proper training at the start, and only through years of experience did they become qualified in this trade. The tendency at that time was that usually both the good and the bad faults in welding were learned and carried on by the new man who was trained by the old time welder. Therefore, there was no noticeable improvement in the work of the new man over that of the old.

At that time, men who wanted to learn welding asked the welder on the job if they could try to run a bead and in time they were doing the welding for the welder. Generally the practicing was done on joints where the final dressing up could be done by the experienced welder. In this manner new welders were developed but many of them were depositing metal not knowing whether they had the correct polarity on the electrode; whether they were obtaining the correct penetration and proper control of molten metal to eliminate undercut or trapped slag in the weld. As a result, there were some failures in welding, and the advancement of this new field was held back on some occasions. Then came the realization of the faults to guard against, and through much research and the proper worker training this field again began to advance.

The men engaged in the development of this field came to certain conclusions: There must be testing of materials to be welded, testing of electrodes and finally the qualification of the individual welder. Thus, the old time welder and the new man coming on had to be tested before doing the particular job. Many companies set up schools to train these men for particular classes of work. Besides this training there were many welding trade schools started throughout the country. At the beginning, all of these schools had little knowledge of just what to teach the student welder and how to equip him to meet different conditions encountered in the field. Many of these schools have been successful in training men while others, due to poor management, inadequate instruction, etc. have not been able to satisfy employers with the product of their schools.

Since so many companies are now training and qualifying their own welders, it might be well to point out some of the best teaching practices and some of the faults found in trade and vocational schools. Besides, there should be more cooperation and understanding between employers and these schools of training and employers should be in a position to evaluate the methods and equipment used by these schools.

Often this question arises among welding men: "How many hours of actual training are required to produce a good arc welder?" The answers will vary from 40 to 300 hr. of training. In all cases these men are probably correct in their statements. Generally it depends on what the welder is being trained to do. Some men work on repetitive production jobs, while others are required to work in all positions, use various types of electrodes and be capable of coping with many different layouts. A man of this type would require the 300 hr. of training and considerable experience, while the former could learn his operation in 40 hr. Still both men are welders.

Such factors as aptitude for the work, age, sex, physical condition and the effort expended will determine to a marked extent the time required for training. A conscientious learner can deposit acceptable fillets and butts in any position after the completion of his training, but he still lacks experience in the different conditions exist-

Industry

ing on the actual job, such as different fits of joints, root opening variation and different welding machines and electrodes. These are problems in which he is not sure of himself when he starts on a new job, but in a short time he acquires this knowledge and gradually gains confidence in his ability to weld.

In many cases a newly trained welder and often an experienced welder will experience "stage fright" when attempting to qualify for a new job. Employers should learn to bear with these new welders by giving them a fair trial to show their ability and skill.

FIG. 1 — The blackboard shows sketches of welding joints in different positions. The student is required to make welds in various postures, including flat on his back on the floor to simulate actual welding conditions in industry.

Trade and Public Schools

The subject of trade school versus public school (vocational) has long been a topic for hot debate. The possibility of developing a good welder does not depend on the type of school. Good welders have been developed from both sources where schools have had the proper equipment, materials, and last, but most important, good instructors and a specific course of training. It has been observed that students paying to learn a trade show more interest and work harder during their training than some students in public institutions.

At the start of this "training era," there were many poor welding schools, but most of these have been eliminated because of the more exacting requirements, and the fact that the men seeking this training demand that they get the best. This has led to fewer but better welding schools. Both types of schools are now working along the same lines, producing better welders through better training.

Numerous training schools throughout the country lack a prepared outline. Many schools are supposed to be following an outline set up by large welding companies who have been training men for years. These companies have aided in this training program greatly, but usually the schools outside fail to carry out the program set up by these instruction outlines. Often the instructors fail to apply these outlines, but train the students according to their own methods. This may result in poor welders.

One school has an excellent plan. It posts an outline of its course in each booth, showing the assignments and the approximate number of hours required for each lesson. This outline receives much attention from new students because they can see what they will receive in their training period. The outline is illustrated in Table I. In addition, there was a blackboard, Fig. 1, which showed welding joints in different positions and how to approach each joint to welding.

Welding Terminology Explained

It took the experienced welders years to learn the meaning of ductility or elongation, preheating, stress relieving, tensile strength, etc. Now students in some schools are taught by relating these terms to some problem they have worked on during their training and by lectures in which simple illustrations are given. For instance, the instructor will simplify the terms ductility and tensile strength by stretching a rubber band. It is explained to the students that the same conditions exist in weld metal. Specimens of all tests and joints should also be shown to the students.

Many of the schools are now using arc controlling equipment, such as the Ronay Arconograph and the A. O. Smith Monitor which aid in controlling the voltage in relation to arc distance during welding. The former unit produces a chart recording the voltage variations. This chart shows the welder variations in arc distance during operation and also reveals where poor welds might exist. The Smith Monitor shows the welder his arc distance through lights located on either side of his head shield. If no light shows, he has the proper arc distance; however, if a light shows on one side it indicates too short an arc, while a light on the other side indicates too long an arc for the voltage setting. These instruments are excellent for training purposes and occasionally they are used to check

TABLE I

Detail Outline of Electric Welding Course

ASSIGNMENTS

Lesson No.		Number Hr. per Lesson Approximate
	PURPOSE: A.C. Welding (Sheet Metal and Aircraft)	
1.	Striking arc and running beads with 3/32 in. electrode	2
2.	Beading and weaving in flat position	4
3.	Weaving (sizes ⅜ in, ½ in.) on 45 deg. and 75 deg. incline	2
4.	Weaving and beading in vertical position upward	4
5.	Weaving and beading in vertical position downward	2
6.	Running horizontal beads on 45 deg. to 90 deg. incline	2
7.	Square butts, from 0 deg.-90 deg. with ⅛ in. plate	4
8.	Fillet welds (size 3/32 in.-⅜ in. 0 deg.-90 deg.) with ⅛ in. plate	4
9.	More practice on Lessons 7 and 8.	4
	PURPOSE: Use of sul-coated (bare) electrodes for conception of flow of molten metal of 5/32 or 3/16 in. electrodes. Use of heavy plate—⅜ to ⅝ in. thickness.	
10.	Beading and weaving in flat position (a) Check polarity required for this type of electrode. (b) Weaves—⅜, ½ and ¾ in. width. (c) Practice stopping and starting to develop penetration in crater zone and smooth appearance.	2
11.	Weaving on 45 deg. and 75 deg. incline (a) Weaves—¾, ½ and ⅜ in. width. (b) Stop after a 3 in. weld and start again, repeating.	2
	PURPOSE: Use of alternating current with coated electrodes—⅛ and 5/32 in. diameter—Bluedac, Westinghouse, Airco No. 90, Genex and others. Handling and rate of deposition (flow slightly different). Remembering factors such as rate of speed of electrodes, flow of metal and slag and position of electrode.	
12.	Weaving and beading in flat position (a) Weaving only four to five times diameter of electrode. (b) Square butts with ½ in. weave both sides. Later repeat with ⅜ and ¾ in. weaves.	4
13.	Weaving on 45 deg. and 75 deg. incline (a) Practice stop and starting—pick up of center, for smooth weld. (b) Weaves—¾, ½ and ⅜ in. sizes.	2
14.	Weaving vertical (90 deg.), repeating previous practices (a) Position of electrode important—usually perpendicular to surface of welding or slightly sloping upward. (b) Watch the flow of metal closely. (c) Observation for distance of electrode from plate, crackling sound, amount of penetration.	4
15.	Square butts in vertical position.. (a) Weaves ¾, ½ and ⅜ in. size on butts.	2
16.	Horizontal beads (a) Stop and start a 3 in. weld. (b) Padding of beads so each is properly interlocking. (c) Development of smooth appearance by proper interlocking of passes. (d) Square butt—three passes—padding.	2
17.	Horizontal fillets, single and multiple passes	6
18.	Downhand fillets (single and multiple pass) (a) Single pass—¼ in. fillet. (b) Multiple passes—⅜, ½, ¾ and 1 in. sizes. Usage of direct current for reverse polarity electrode, such as Fleetweld No. 5, Vertex, Champion Blue Devil, General Electric W22, Reid Avery HD-7, Wilson 89, Air Reduction 78, Una 3100, etc. **Purpose of this type of electrode:** Better penetration, greater elongation, used for vertical and overhead welding, more spatter losses than straight polarity electrode. Maximum size used in vertical and overhead is 3/16 in. diameter. Prevent undercut by weld by hesitating on each side and washing the metal to the side walls.	6
19.	Fillets on 45 deg. and 75 deg. incline (a) Practice weaving on previous fillet in 45 deg. incline. (b) Single pass—¼ and 5/16 in. fillets. (c) Multiple pass—⅜, ½ and ¾ in. fillets.	4
20.	Fillet in vertical position (90 deg.) single and multiple passes (a) Single pass 3/16, ¼ and 5/16 in. sizes. (b) Multiple pass ⅜ and ½ in. (2 and 3 passes, respectively) (c) Avoid undercut by hesitating on each side wall. (d) Check size of fillet with gages. (e) Repeat part of lesson with various thicknesses of plate.	14
21.	Vertical fillet, single pass production welding ¾ in. size—5/32 and 3/16 in. electrode. (a) Single pass fillets.	8
22.	Flat bevel butt 60 deg. (a) Without backing strap. (b) With backing strap. (c) Multiple passes.	8
23.	Vertical bevel butt without back strap (a) Root opening—⅛ in. (b) Root opening—flush. (c) Weaves over balance of groove.	6
24.	Bevel butts in vertical position with backing strap (a) Root opening—¾ in. (b) Rot opening—5/32 in.	12
25.	Hand and automatic gas burning.. (a) Beveling of plates. (b) Straight edge cutting.	6
26.	Horizontal bevel butt welds with backing strap (a) Root opening equals diameter of electrode.	6
27.	Overhead fillet—single and multiple passes (a) Single pass—3/16 and ¼ in. size fillets. (b) Multiple passes—⅜ and ½ size fillets. (c) Single pass fillet—⅜ in. size weaving technique.	18
28.	Black to galvanized fillets..... (a) Single pass vertical fillet—¼ in. size. (b) Multiple pass vertical fillet—¾ in. size. (c) Single pass overhead fillet—¼ in. size. (d) Multiple pass fillet overhead —⅜ in. size.	12
29.	Overhead bevel butts (60 deg.)... (a) Root opening—3/16 to ⅜ in. (b) Root opening—¼ in. (c) Root opening equals diameter of electrode.	18
30.	Navy qualification test No. 1.....	10

experienced welders when they work with a new electrode. This equipment is an asset to any manufacturer or school.

The proper understanding of heat control on welding machines has puzzled many experienced welding operators as well as the students in welding schools. Experience on a variety of welding machines is very important in the development of good operators. Welding machines, both alternating and direct current, of approved type should be in all welding schools. The old time welder may or may not have a knowledge of the machine he is using, but he encounters little trouble because he has a conception of welding heat and molten metal which he has gained through many years of experience. Under today's conditions, however, it is essential that welding schools teach these facts quickly and thoroughly.

Distinguishing Polarity

Time after time, in different schools, this simple question is asked of the student: "How do you distinguish straight polarity from reverse polarity?" The student is puzzled. Then the instructor gives this answer: "Straight polarity exists when the work is positive and the electrode is negative," then he slides on to another question. The class is still puzzled but they fail to question further. They still do not know how to control the flow of current with the many types of electrodes. Instructors fail to realize that this situation results in dissatisfied students. Now, it has been found by asking the student to repeat the answer several times and in addition having him actually change polarity on different welding machines he will never have that trouble again. In many cases the student tries to memorize the answer which the instructor gives or places on the blackboard, as in the following manner:

	Work	*Electrode*
Straight polarity	+	—
Reverse polarity	—	+

The student tries to remember all four signs and usually fails. This effort has been reduced through simplifying it to just one sign, such as electrode negative (—), indicating straight polarity. The student can also be taught to test current quickly on d.c. equipment by taking a reverse polarity electrode and striking an arc. If this results in a loud hissing sound with high spatter losses and little penetration, then he knows that

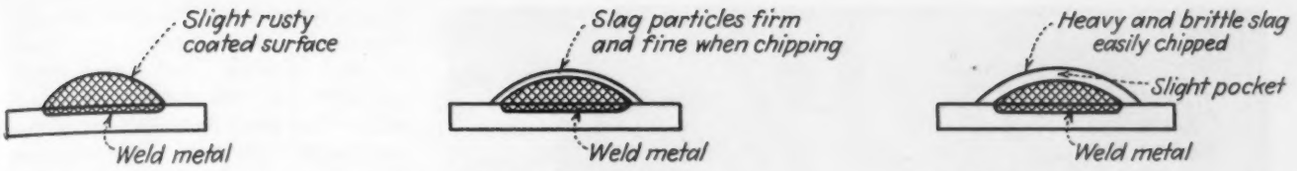


FIG. 2—Bare, organic (cellulosic) and mineral coated electrodes may be distinguished by the appearance of the deposited metal and the character of the slag.

straight polarity exists. If he reverses the polarity by switch control or by reversing the cables and he gets good penetration, and proper crackling sound, this shows that correct polarity exists. It is hard for a student to check polarity with the aid of a straight polarity electrode. Only experienced welders can distinguish polarity with such a rod and many times they fail to notice the difference because these rods sometimes can be used with either polarity. Most all straight polarity rods can be used with alternating current.

Some welding machines have single control while others have dual control in which there are several ways of varying the voltage and current, making it hard for students to understand the machines. Today many of the machines of dual control are equipped with set-ups to aid the welder, but to welding students and some experienced welders these machines appear complicated because the welders do not understand how to control voltage and amperes proportionately. Some machines have separate voltmeter and ammeter while others have the two combined into one instrument. Many good student welders fail to secure a job sometimes because they lack the knowledge of setting an unfamiliar machine. We are now pressed for time and with companies demanding welders with this background, the welding schools should provide some means whereby the student can secure this knowledge.

Welding heat control is important to the student as well as the experienced welder. Both often state that a certain electrode requires so much heat with one machine, while with another so much more or less. Many times experienced welders mislead student welders in the reading of welding heat on machines, by stating that a certain machine needs so much heat for a certain electrode, while at school they were told to use less current, sometimes varying 20-30 amp. These experienced welders neglect to tell the student welder all the facts existing during welding, such as machine control, types of material, thickness, etc., obviously the registered amperes and volts at the arc will be the same on all machines. To overcome these difficulties, the welding schools should give their students more opportunity in handling of the machines. In this way students may gain experience which took the old time welders years to secure.

The place provided for the student to learn this trade is usually a booth of standard size which has a table and positioning fixtures so he can acquaint himself with different positions of welding. Many students acquire the art of welding by sitting on a chair in front of a table. This practice is fine, but in some sessions he should be told to stand up to weld, or sit or lie on the floor. He may also be told to weld high places by stretching his arm in order to reach that section, welding with one hand while holding to a pipe or structure with the other. This is what is encountered in shipbuilding, structure and field welding.

Welding Electrodes

A better understanding of welding electrodes—the types manufactured and their purpose—is developing among operators. But still many of the men have trouble in distinguishing between straight polarity electrodes and those of the reverse type, or a "cold" rod from "hot" rod. A common expression among welders is, "this electrode is better than any other on the market and I can tell you immediately what make it is by running a few beads." Such a statement has proved to be a fallacy as was shown by tests given to experienced welders. Several leading brands of electrodes were dyed black and marked by code. These were given to the welders for a simple test, such as running beads in flat, vertical and overhead positions. The welders then indicated the name of the manufacturer of the electrode used. Only 1 per cent of the welders guessed the manufacturer of the particular electrode they were using. If this is true among the men of experience, how can student welders be expected to know the difference between electrodes, since brand names mean nothing to them? The answer is simple. First determine if the electrode meets with governing specifications; if so, then it is an acceptable electrode no matter who the manufacturer may be. Individuals using a certain electrode of approved type may find that electrode best for their job. Some electrodes have a lower rate of deposition but a uniform deposit, while others have a higher deposition rate but irregular peeling of coating and trapping of slag, thus making poor welds. Some electrodes give off various odors during welding and some blister, although the weld deposition is good. These factors exist to a great extent in reverse polarity electrodes of the organic type. It is important to teach the student to remember the difference between electrodes through relationship as to class, type and rating according to specification.

TABLE II

Comparative Welding Heats for Various Sized Rods and Coatings

Diameter Size, In.	COATED ELECTRODE			BARE ELECTRODE
	Organic		Mineral	Sul-coated
	Reverse	Straight		
1/8	90-110 amp.	5 per cent higher	20-25 per cent higher	10 per cent higher
5/32	120-140 amp.	5 per cent higher	20-25 per cent higher	10 per cent higher
3/16	140-160 amp.	5 per cent higher	20-25 per cent higher	10 per cent higher

FIG. 3—Some qualification tests for welders are almost impossible for even an experienced welder to pass. Here the standard U-bend test is being demonstrated for the benefit of students.

Students have a hard time remembering current settings for electrodes of different diameter due to the fact that the present heats given for electrodes vary somewhat in range, as well as the fact that there are many types produced by different manufacturers. It has proved difficult for even an experienced welder to remember all these currents. This may be simplified as illustrated by Table II.

Bare electrode will require currents 10 per cent higher in value than electrodes of reverse polarity; while straight polarity electrodes will average 5 per cent higher. Mineral coated electrodes, which can be used with a.c. or d.c. current, will be 20-25 per cent higher than those of the reverse polarity class as shown. Keeping these sizes and currents in mind the operator can apply his common sense for smaller and larger electrodes to be used. He should also take into consideration the thickness of plate being used on the particular job. The general tendency, however, is to use too much current on heavier plate.

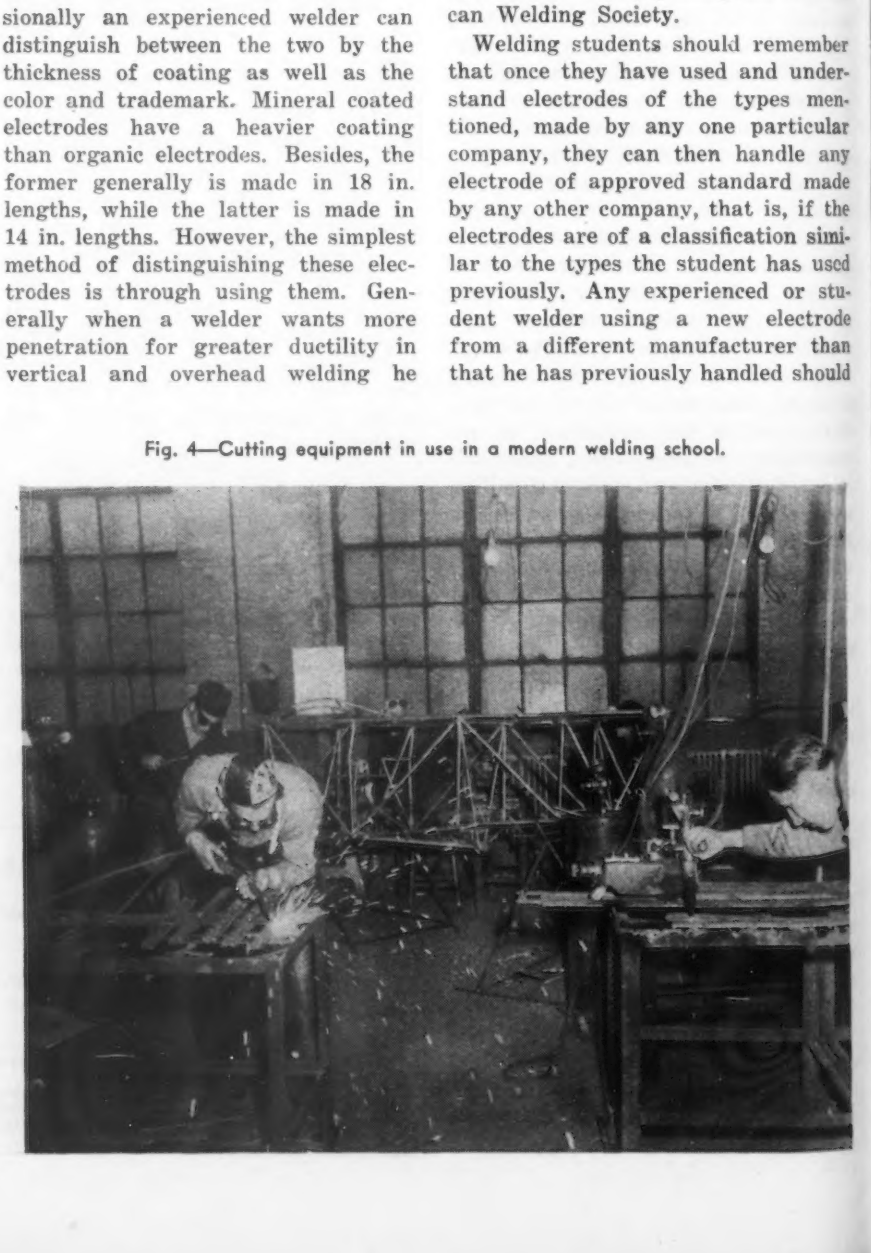
To ask a welder or student welder to distinguish electrodes by thickness of coating and by color is too difficult an assignment, but by a simple test whereby a bead is made by each type of electrode—bare, organic or mineral coated, the welder or student can tell the difference as shown in Fig. 2.

Organic electrodes are called cold rods, either straight or reverse polarity, while mineral electrodes are called hot rods by the welders. Occasionally an experienced welder can distinguish between the two by the thickness of coating as well as the color and trademark. Mineral coated electrodes have a heavier coating than organic electrodes. Besides, the former generally is made in 18 in. lengths, while the latter is made in 14 in. lengths. However, the simplest method of distinguishing these electrodes is through using them. Generally when a welder wants more penetration for greater ductility in vertical and overhead welding he uses a reverse polarity electrode with organic coating. Should he desire higher ductility and less tensile strength, but still greater than that of the base plate he should use a mineral coated electrode. This electrode is used only in flat position and horizontal fillets. The straight polarity electrode of organic type should be used when high tensile strength but less ductility is required. This electrode is called the poor fit-up type and generally gives less spatter loss and is easier to handle than the reverse type.

By remembering these points a beginner may learn many things which have taken experienced welders years to find out. In addition to this background, these learners may secure many facts by reading welding articles in industrial magazines, etc., and welding information which can be obtained from any of the welding equipment manufacturers, or from books. Experienced men working in the field as well as students can learn much by joining the American Welding Society.

Welding students should remember that once they have used and understand electrodes of the types mentioned, made by any one particular company, they can then handle any electrode of approved standard made by any other company, that is, if the electrodes are of a classification similar to the types the student has used previously. Any experienced or student welder using a new electrode from a different manufacturer than that he has previously handled should

Fig. 4—Cutting equipment in use in a modern welding school.



be given a trial run in working the electrode before taking a test of any sort.

Types of Tests

Both student and experienced welders in the past two years have encountered many new types of tests to qualify for shipyard, industrial and aircraft welding. Most of these tests are laid out by the company or the individual giving the test. Many of these tests could not be passed by experienced men or even the person who suggested the test. Often small shipyards require new welders to prepare vertical and overhead butt welds with no root opening, 60 deg. bevel and 3/16 in. electrode and require 100 per cent penetration, while others give the same test with the length of the weld 1½ in. and want 100 per cent penetration without any chipping out on reverse side or permitting backwelding. Another test given in the field at present is called a production test which consists of making a ⅜ in. fillet in the vertical and overhead position in one pass with a 3/16 in. electrode. This requirement is used on cargo ship welding where gage inspection is used rather than considering the strength of the fillet. In this method of welding it is difficult to get a penetration in the root of the welded area. The proper method of making a vertical fillet of that size is to use two passes while the overhead should have three passes.

The contention of many welding foremen is that this production welding saves time and therefore reduces labor cost, which is the largest cost factor in welding. It has been proved that a good welder can make a fillet weld of that size in the correct amount of passes faster and make a better looking and sounder job than by using the so-called production method. Sometimes too much production results in poor welding and this holds back new welding applications.

Another test that has been given by many companies requires that the welders do vertical and overhead fillets of ⅜ in. size in two and three passes respectively with a 3/16 in. electrode on 3/16 in. and ⅛ in. plate thicknesses, black to black steel or sometimes black to galvanized. The latter requires more hesitation on the galvanized plate and undercut on the legs of the fillet is not permitted. The percentage of welders who can successfully handle these tests is very small.

Sometimes tests are given on 11 or 12-gage material having square butt joints and the welders are told to weld with 3/16 in. and ¼ in. electrodes usually carrying maximum current for each electrode in flat position. Still another test given was on ⅜ in. plate with square butt and 3/16 in. opening placed in vertical position to be welded with 5/32 in. electrode. The first pass had to be welded in the opening with an upward technique, then a second pass had to be put on with a 3/16 in. electrode welding downward and the third pass also had to be welded downward for the finishing bead. On the reverse side two more passes were to be placed with a 3/16 in. electrode welded downward. Welders were not allowed to chip out the reverse side, but were required to have 100 per cent penetration. Most welders failed in the test, because the weld was given a nick bend which is a very severe test on any weld metal. To make matters worse, in this case the test specimens were made by a hand-cutting torch rather than by machining and still good test results were expected.

Those giving the test failed to consider that in welding heavy plate the technique should be upward to secure more penetration and furthermore, that there is a greater possibility of trapping slag in welding downward. In addition to this the welder should have had a chance to chip out part of his weld on the reverse side in order to eliminate porosity and get 100 per cent penetration. There was a slight possibility of passing this test, but why make bad welds and mislead the welders in this technique?

These companies have learned and in the past year have returned to more logical tests which are practical and lead to good welding practice. These are standard qualifications for welding and it is better to adopt these tests, even though the apparent cost may be higher. In the end they will be cheaper and the employer will have a real knowledge of the ability of his welders. It is true that all good welders are working but companies should give the student welders a chance at these tests in order to grade their ability. Students should have a diploma or some proof of their schooling with them to show prospective employers. Students are often afraid to do this because they are usually paid a low wage even though they pass all the required tests. While they lack experience, if properly schooled, they have a welding knowledge that took the old time welder from three to five years to secure and in a short time they will adapt themselves to their task.

The American Welding Society has adopted an outline showing the minimum requirements to train welding operators. This outline will guide all schools and only schools complying with these requirements will be recognized.

Nitrogen Bearing Cr and Cr-Mn Steels

IN investigations on chromium and chromium-manganese steels containing nitrogen carried out by H. Krainer and O. Mirt and described in Report No. 583 of the materials committee of the Verein deutscher Eisenhüttenleute ("Archiv für das Eisenhüttenwesen"), a number of test steels were prepared from low-C ferro-chrome by treatment in ammonia at temperatures between 700 and 900 deg. C. This alloy was then added to the steel melt, after most of the Cr had dissolved. The nitrogen content in the steels was about 1/75th of that of Cr. In all, 17 alloys were melted and submitted to dilatometric, magnetic, microscopic and X-ray examination, with a view to plotting the equilibrium diagram for these steels. From the results a section through the iron corner of the Fe-Cr-N diagram for the Cr:N ratio of 75:1 was deduced. The nitrogen caused a marked expansion of the gamma-range and the gamma-alpha miscibility gap. With the nitrogen values used, only alloys with above 30 per cent Cr proved purely ferritic.

In another 35 steels with 10 to 35 per cent Cr, 2 to 23 per cent Mn and 0.11 to 0.44 per cent nitrogen, the hardness, notched-bar values were examined, and magnetic, microscopic and X-ray studies carried out, in both quenched samples and samples reheated to different temperatures. The phase boundaries for Cr-Mn-N steels were deduced for quenched specimens and those reheated to 700 deg. In the Cr-Mn steels the nitrogen was observed to expand the range in which austenite remained stable and displaced the limits at which the brittle σ-phase occurs towards higher Cr values.

Coring Kirksite Dies

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By W. G. McCONKEY

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. . . More than 50 per cent of Kirksite metal in a die can be saved by coring. How cored dies can be made without distortion is here told step by step.

WITH the present shortage of Kirksite "A," which is used in general foundry work for making dies, the use of cores in hollow dies has been instituted. In the past, it has been contended that coring to any great extent would introduce distortion in the casting. When Kirksite solidifies,* it shrinks with a constant predictable reduction in volume. The presence of baked cores prevents the cooling metal from shrinking normally. This causes the walls of the casting to buckle and bend, and a warped and twisted die results.

However, experiments with coring of dies, such as those used for forming on the Erco Stretch Press and the Toledo Press, have been successful in producing accurate castings of less weight, through the following operations.

When plaster die patterns are made, extreme care is exercised in their fabrication to allow for the Kirksite shrinkage. This is done in order that only a minimum amount of metal be retained for grinding and finishing. This procedure is also applied to the preparation of core boxes for punches of Kirksite, and is now considered general practice in the plaster pattern shop.

Ordinary green sand, with Kirksite arbors added for strength, is used to form the core (Fig. 1). Kirksite arbors have been found adaptable for this

**For other operating data on Kirksite, see* THE IRON AGE, *issues of May 28, June 4, 11 and 18, Aug. 27 and Oct. 1, 1942.*

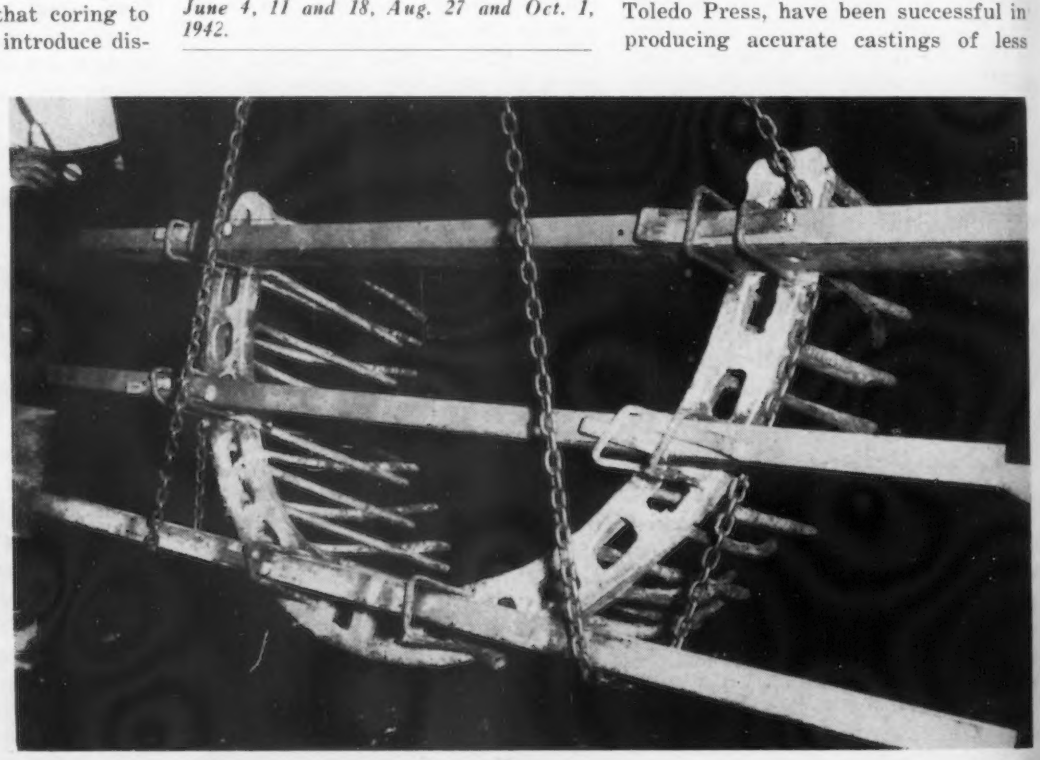

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FIG. 1—Arbor for green sand core for die which will be used to make leading edge on an engine cowl. Note the U sections on the lifting chain, extending 1 in. into the arbor frame.

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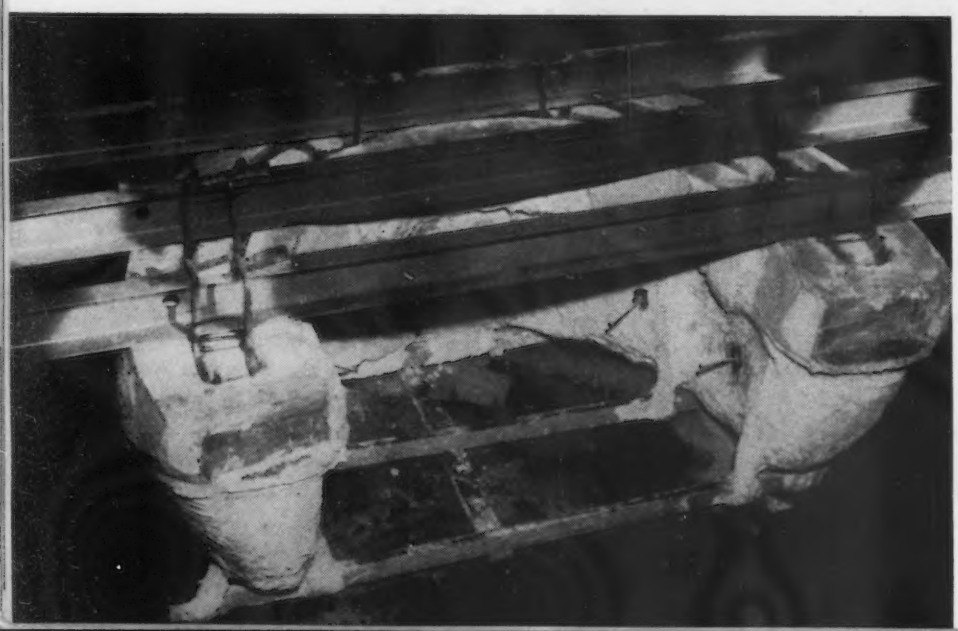
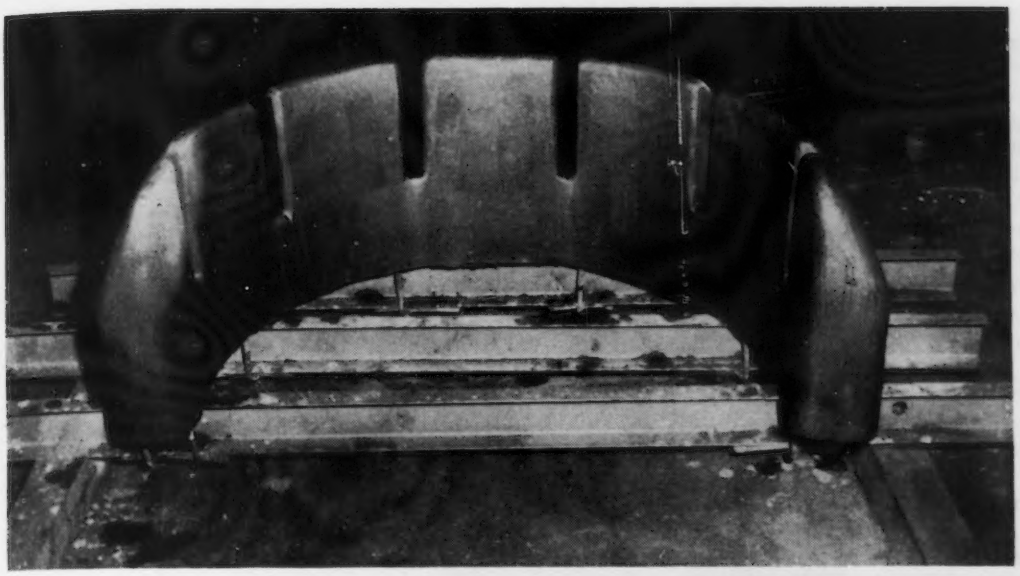
BELOW

FIG. 2—The arbor, placed in the core box, is clamped rigidly by the U sections to the lifting channels. The framework strengthens the sand core for the Kirksite casting.





LEFT

FIG. 3—The finished sand core is sprayed with an iron oxide and water mixture which, after being dried with a torch, forms a hard crust.

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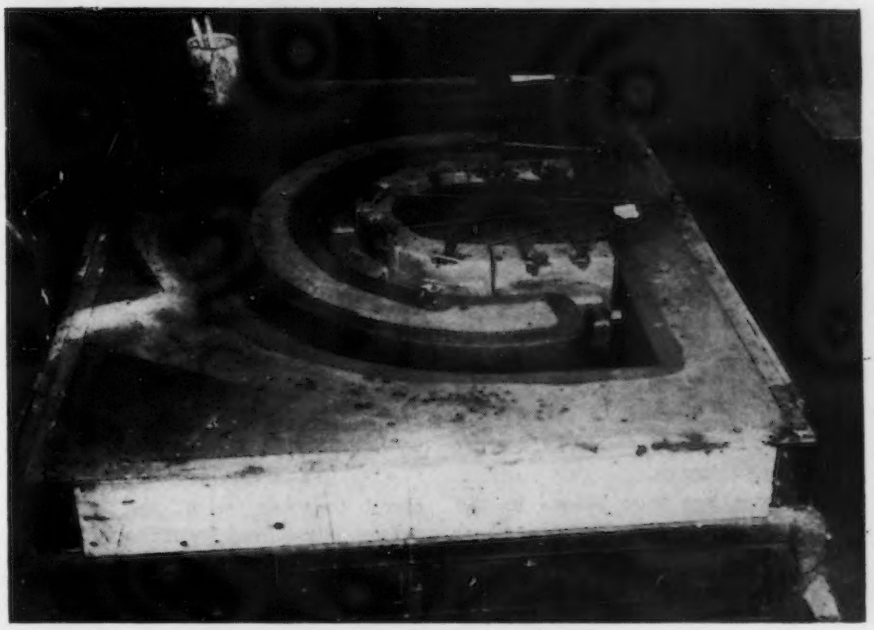
BELOW

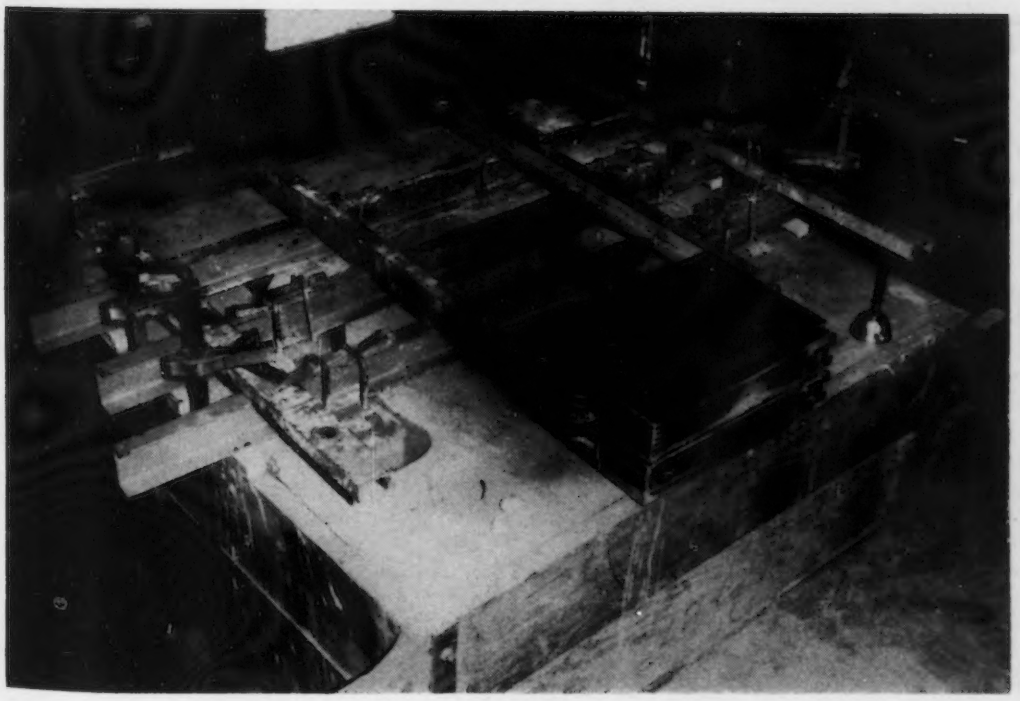
FIG. 4—Core in a mold, ready for the molten Kirksite metal. This die is for making parts for the B-25 Mitchell bomber.

purpose due to their simplicity of design and the economical method in which they are fabricated.

The preliminary step in fabricating a sand core is to cast a plaster shell from a pattern for the core box. An additional wall is added to allow for the thickness of the casting base, and ¾ in. is added to the height of the core box to provide for mounting lugs on the finished die. This procedure is general foundry practice.

In preparing the core box for casting the arbors, a heavy brown paper placed against the plaster will prevent the sand from sticking. After the sand has been placed in the core box, dowel pins are inserted. Three-eighths in. dowel sticks are used to make holes in the rammed sand. Care must be taken when these pins are inserted,





o o o

LEFT

FIG. 5—The core is clamped to the channel, which is weighted down sufficiently into the mold to prevent any die-distorting movement.

o o o

for if they are rammed into sand that is packed too hard, the arbor core will be distorted. A "walk over" or hand packing, with small tapered wooden tampers, provides sufficient pressure to form and hold the sand compact for the fabrication of the arbor.

Before the molten Kirksite for the arbor is poured, U sections of ⅜-in. reinforcement rod are formed around a lifting channel which runs the full length of the core box. These rods extend a sufficient depth into the core to make at least a contact of 1 in. into the arbor frame. The arbors are poured separately from small hand ladles for economy and as a safety measure to prevent the rammed sand from being disturbed.

The Kirksite arbors set in about 20 min., and are then given a "clay wash" to fill in any cavities in their surfaces. After the wash, they are placed in the core box (Fig. 2), clamped by the U sections to the channel, and, if necessary, separated by wooden ribs which will act as reinforcement for the die. The arbors are then rammed with green sand and, together with the wooden ribs which have been inserted loose, are drawn from the core box by the U sections that have been clamped rigidly to the lifting channel. The cores, with the arbor inserts, are sprayed with plumbago, an iron oxide and water mixture which, after being dried with a torch, forms a hard crust on the core (Fig. 3).

The cores are then placed in the mold and clamped to the channel which is weighted down sufficiently into the mold to prevent any movement which would cause distortion in the finished die (Figs. 4 and 5).

When the Kirksite is poured into the mold from a ladle, care is taken to prevent the molten metal from running heavy in order not to disturb the surface of the green sand core.

After the metal has cooled, the sand core, together with the Kirksite arbors, is removed from the mold. The arbors can be remelted and used again.

The excess material on the punch and die is removed on the planer and then, together with the pressure plate, they are turned over to the die grinders for polishing and finishing (Fig. 6).

As an example of the amount of metal saved a pressure plate punch die which formerly weighed 7200 lb., weighs, cored, only 2820 lb., a saving of 4380 lb. of metal.

FIG. 6—The cored Kirksite casting, ready for planing and smoothing. The sheet metal assemblies made from it will be used on B-25 Mitchell bombers.

Rust Inhibitor for Shell Cases

ESPECIALLY suitable for shell cartridge cases, the Diamond Alkali Co. has recently perfected a new rust inhibitor which two pioneer steel cartridge case makers already are using.

Outstanding features of the new material are said to be the saving of time, the small cost involved, and the suitability of the protection before lacquering. The compound is used in an aqueous solution to inhibit the formation of rust on clean, pickled steel or iron, and is said to form a rust-free tight bond for the application of paint, varnish or lacquer.

The company has found that no visible or measurable coating is deposited by the inhibitor and the company's chemists call its action one of passivity. The solution which runs 14 oz. of material for each 100 gal. of water has a pH of slightly above that of tap water.

The recommended usage of the inhibitor, which so far has been used almost entirely in the steel cartridge case industry, is as follows:

(1) Hot alkali clean to remove all traces of grease, oil and dirt.

(2) Overflowing flush rinse.

(3) Pickle (sulphuric acid 10 per cent by weight) 160 to 180 deg. F. to remove all rust and scale.

(4) Cold overflow flush rinse. (Twice to insure acid removal.)

(5) Make up rust inhibitor tank at 14 oz. per 100 gal. of water. Keep tank hot, from 160 to 180 deg. F. Dip the article following operation No. 4 for 30 sec. to 1 min.

(6) Hot forced air dry immediately following operation No. 5.

The company has found that a cold rinsing seems to insure the article keeping wet from the time it leaves the pickle bath until it gets into the inhibitor. It is claimed this eliminates the possibility of rusting, which might result with a flash drying action encountered by using a hot rinse. The company recommends an overflowing or a flush rinsing to insure removal of pickling acid before entering the rust inhibitor.

According to the company, steel cartridge cases, which have been processed with the rust inhibitor, have withstood the salt spray, abrasive and firing tests of the Army. Alkali's new rust inhibitor was discovered following a request from customers for an inhibitor which would not result in too much of a coating, since the tolerances on steel shell cases are extremely tight.

Automatic Riveting at Vultee

THE manufacturing reseach department of Vultee Aircraft, Inc., has announced the development by its engineers of an automatic rivet injector designed to obviate lost motion and the loss of rivets resulting from conventional riveting practice in the aircraft industry.

Seen as an aid to speeding up of production, the device is a portable riveting tool with an automatic injector which inserts the rivet in the hole and performs the riveting operation without the necessity of removing the tool from the work.

In addition to speeding up work, the new tool is said to eliminate the loss of large quantities of rivets and the necessity for expensive sorting machines, the gathering of fallen rivets from floors and the loss of time required for the sorting. Another advantage of the unit is that it leaves the operator's hands free to perform the riveting operation.

By combining the unit with another device developed by the Vultee Field Division, known as the "Vultee Riveting Yoke," complete riveting operations can be carried on by one person. This combination also makes it possible to provide hopper type feed containing large quantities of rivets. The automatic rivet injector as shown in the photographs, is designed to fit any standard riveting gun. The unit is compact and adds very little weight to the gun.

RIGHT

BOTTOM view of automatic feeding unit.

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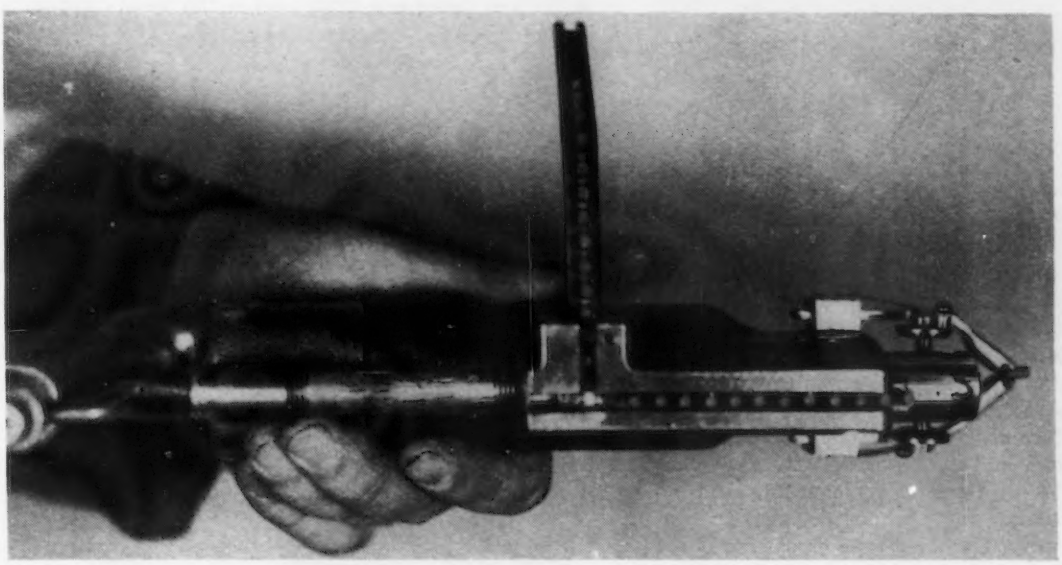
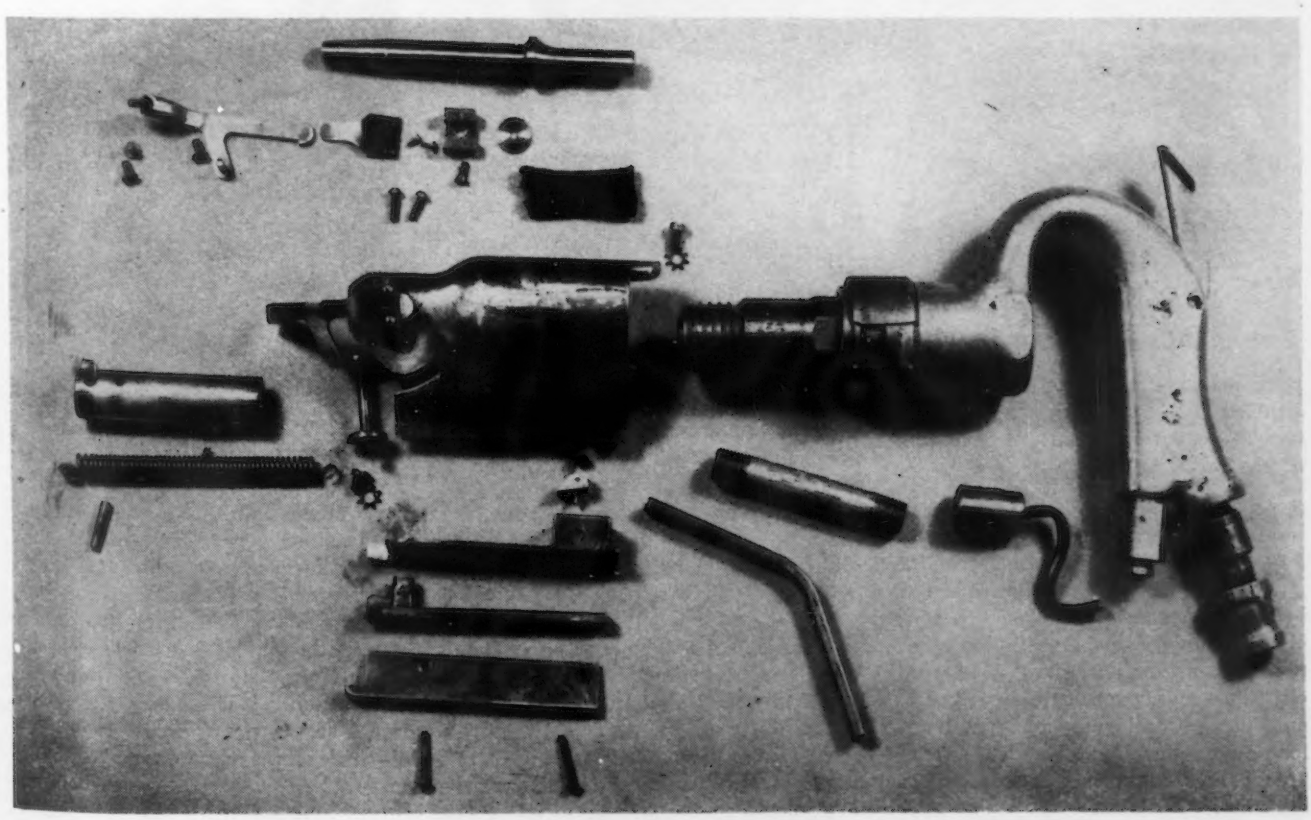
BELOW

DETAIL parts of automatic rivet injector and gun.



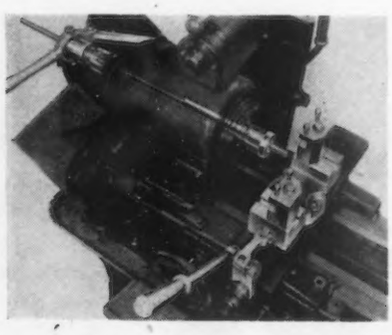


New Equipment . . .

Small Tools and Gages

Many new small tools, gages, tool accessories and other useful items around a shop or plant are described in this week's section on new equipment.

TWO new accessories that are claimed to convert most small and medium size engine lathes into the speed range of hand production screw machines are announced by the *Kessler Aero Products Co.*, 211 West Palm Avenue, Burbank, Cal. The Aero quick-acting collet closing attachment handles duplicate work on bar and tubing stock from 1/32 to ½ in. diameter by chucking and releasing work while the lathe is running. The lever-type cross slide, used in conjunction with the collet closer, provides for forming and fast cut-off.



Both attachments may be easily assembled without machine work or interference with the normal operation of the lathe.

Cellular Grinding Wheel

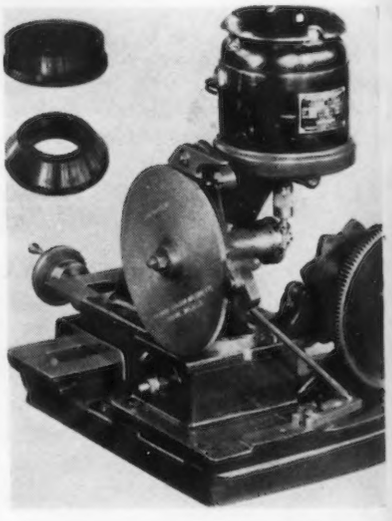
A NEW precision grinding wheel of open, cellular construction has been announced by *American Emery Wheel Works*, Providence. The open, porous construction gives good chip clearance and space for air cooling to cut hardest alloyed steels without loading or burning. The wheel cuts freely and requires a minimum of dressing.

Automatic Rivet Bucker

BUCKING and riveting simultaneously is now possible with a new automatic bucker announced by the *Aero Tool Co.*, Burbank, Cal. The bucker may be used with any standard rivet gun and can be furnished with specially designed heads for any type of aircraft construction. Rivets are driven instantly in perfect alinement. On horizontal structures, rivets can be preloaded. On vertical structures rivets can be inserted in the usual manner or can be pre-loaded and taped. There is no yoke deflection. Opening and travel of bucking bar are limited only by the accessibility of the part to be riveted.

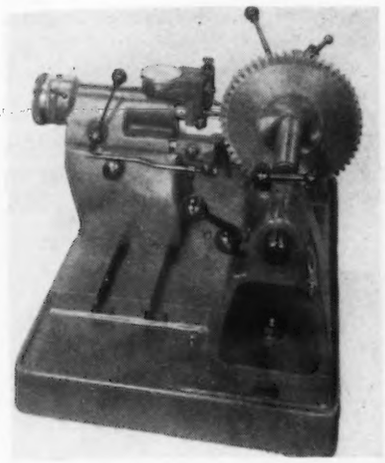
Marking Machine

GRADUATED collars and rings are accurately calibrated and marked by the new precision marking machine offered by the *New Method Steel Stamps, Inc.*, 145 Joseph Campau, Detroit. The piece to be marked is mounted on the spindle of the machine, which is indexed by the master cam and latch mechanism according to desire spacing of graduations. The graduations are then cut to specified length between each setting of the indexing spindle by the high-speed cutter mounted on the vertical motor spindle.



Gear Checking Devices

THE FELLOWS GEAR SHAPER CO., Springfield, Vt., has recently placed on the market two new devices for checking gears. One of the fixtures, known as a cone-pointed testing fixture, is used for checking concentricity of the pitch circle; the other fixture, illustrated, is used for checking the circular pitch, or tooth to tooth spacing. These fixtures comprise a base upon which three adjustable brackets are mounted. Two of the brackets carry the work-holding centers and the third bracket, which



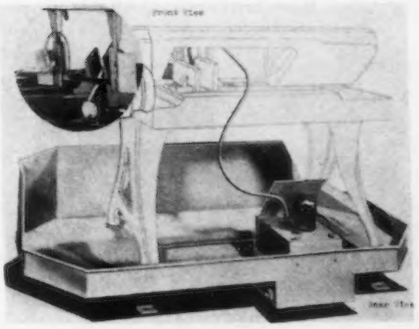
is located at right-angles to the brackets carrying the centers, retains the measuring pointers, fingers and dial indicator, as well as the indexing mechanism. On the fixture illustrated, the spindle carrying the locating and measuring fingers is provided with a graduated collar at the rear end, so that the fingers can be set normal to the helix, if desired, when checking helical gears. The "measuring" brackets for the cone-point and circular-pitch testing are interchangeable on the same base.

Coolant Pump

A NUMBER of new coolant and circulating pumps have been added to the line offered by *Ingersoll-Rand Co.*, 11 Broadway, New York. Included are ¾ and 1 in. side-wall mounted types, a 1¼ in. side-wall mounted type for low submergence applications, and a 1¼ in. horizontal type. These pumps are suitable for installation on lathes, drills, automatics and other machinery requiring a coolant or circulating unit.

Coolant System for Band Saws

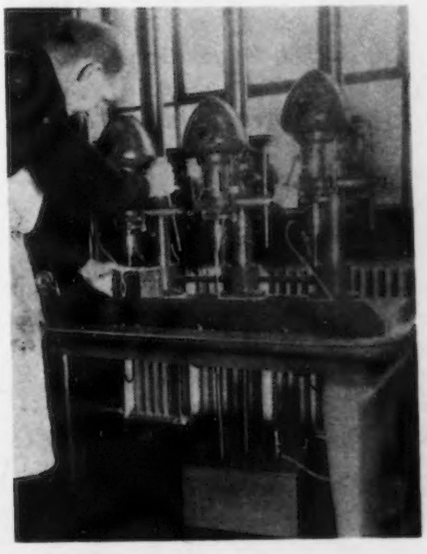
INCREASED saw blade speed, smoother cuts and reduced blade wear are claimed advantages accruing from use of a new coolant system for horizontal band saws developed by *Gray-Mills Co.*, 213 West Ontario Street, Chicago. The new unit fits all types of horizontal band saws. It has a Gray-Mills pump mounted in a coolant return pan which in turn is attached below the saw. The coolant is caught in the return pan and recirculated through the pump. The entire system is easily attached or removed; no drilling or alteration of the saw is necessary.



An unusual feature is the oil feed tube which is slotted to fit the saw blade, assuring a full distribution of oil over the blade. Gray-Mills has also developed a specially blended cutting oil called Flo-Bac Saw-Kut No. 5, for band saw applications.

Portable Coolant Pump

THE EASTERN ENGINEERING CO., 45 Fox Street, New Haven, Conn., announces a self-contained portable coolant pump with tank, designed for use on lathes, shapers, milling machines and other machines where a steady stream of coolant or cutting oil is necessary. The maximum pressure is 4½ lb. per sq. in. and maximum capacity 3¾ gal. per min. The unit is available for permanent mounting. Flow of coolant may be easily regulated to meet different requirements.



Coolant Pumps

NEW coolant pumps are offered by the *Atlas Press Co.*, Kalamazoo, Mich. These pumps are designed on the centrifugal principle. A four-bladed impeller, driven directly by the motor shaft, is the only moving part below the motor. A turn of the control valve adjusts coolant flow from drip to strong washing action. Impeller and motor shaft are braced and protected by an iron housing attached to the motor flange and base plate. Large dirt particles are collected by a strainer enclosing the lower portion of the pump. Pipe nipple outlet accommodates hose or pipe.

Electric Drill

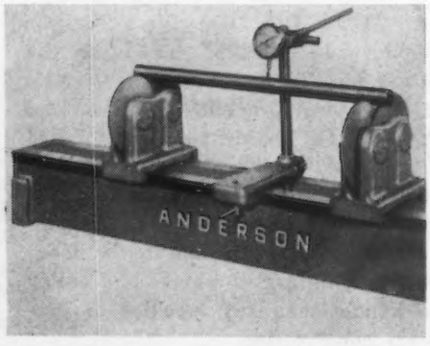
INDEPENDENT PNEUMATIC TOOL CO., 600 West Jackson Boulevard, Chicago, announces the Thor plastic ¼-in. portable electric drill. The grip handle, field case and gear case of the drill are constructed of a new light-weight plastic. The drill is claimed to have more power per pound, greater strength and protection from shock and to be more compact, lighter in weight and cooler to handle than any machine of previous construction.

Dust Collector

THE new model dust collector, offered by *Aget-Detroit Co.*, 2040 Book Building, Detroit, has a rated volume of 600 cfm. and 4.1 in. s.p., making it suitable for collecting dust and dirt from tool, cutter, precision and similar grinding operations. The unit is portable and self-contained and is available with either one or two inlets as required. The dust-laden air which is pulled away from the grinder wheels by the belt-driven fan, receives its initial cleaning in the dust removal pan located immediately below the drum-type filter. A final cleaning stage is the filter material itself. The re-circulation of cleaned air into the working space not only obviates long connecting ducts to the outside wall, but reduces the amount of heat required.

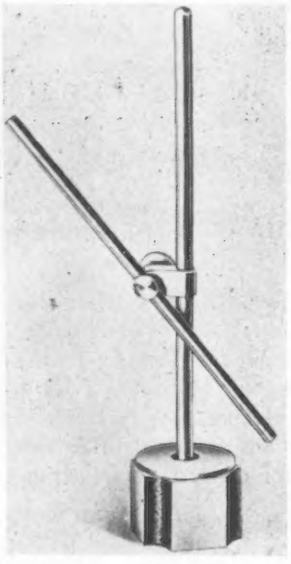
Shaft Checking Unit

EQUIPMENT for the checking of straight shafting, tubing or pieces that have the same diameter at both ends has been developed by *Anderson Bros.*, Rockford, Ill. Work is mounted on disks which rotate in ball bearings. The unit provides for balancing as the spindles and bearings are the same standard supersensitive parts used in Anderson balancing machines. The Roto-checker, as the unit is called, will handle work 36 in. long, with larger sizes available to suit requirements.



Magnetic Adapter

A STREAMLINED magnetic adapter for dial test indicators, surface gages and gage block applications is announced by the *Windermere Mfg. Co.*, 205 East 42 Street, New York. By removing the upright center post and collar, the adapter is transformed into a general work holding block that may be used to anchor parallel, angle iron and work pieces in any given position. The strength of the magnet



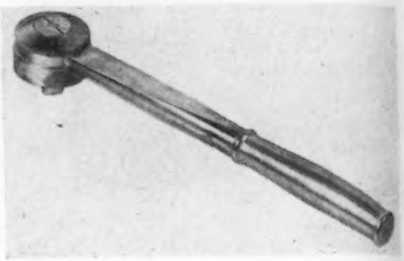
is more than ample to support the indicator at the extreme end of the center post in any position.

Milling Cutter Gage

SEVERANCE TOOL INDUSTRIES, INC., Saginaw, Mich., have recently brought out a comprehensive midget milling cutter gage. Printed on heavy cardboard in two colors this die cut piece should prove valuable to purchasing and departmental heads as well as receiving and shipping departments and tool crib clerks. The piece provides accurate measurements for tool diameters, radii, number of teeth per in., angles of cutter teeth, decimal equivalents, recommended operating speeds for midget milling cutters and other information. The cutter gage will be mailed free of charge by writing to Department A, Severance Tool Industries, Inc.

Socket Wrench

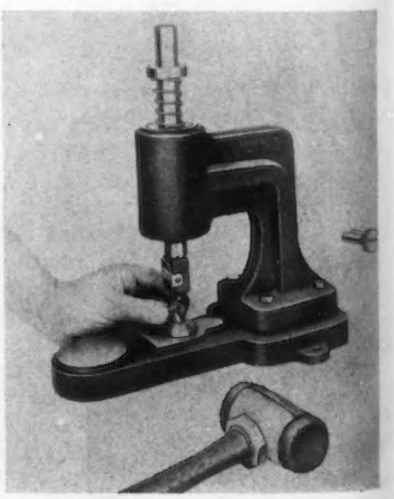
WEDGE-LOCK is the name of a new type of socket wrench made by the *F & H Mfg. Co.*, 2207



West Jefferson Street, Los Angeles. Two hardened steel free-moving shoes serve as an instantaneous acting clutch. At the point the handle comes to a stop on the back swing, the wrench is immovably locked for the tightening pull. The minimum return motion before engaging is: clockwise 1.2 deg.; counterclockwise, 1.2 deg. Operation is unaffected by oil or dirt. The wrench is available in sizes from ¼ to ¾ in.

Screw Marker

SMALL knurled head thumb screws, cap screws, nuts and similar parts may be easily marked with the new Hercules No. 2 outfit, announced by the *Acromark Co.*, 341 Morrell Street, Elizabeth, N. J. The part to be marked is dropped into a form or holder in the base of the unit and when a blow is struck with a mallet, the type or insert die in the holder in the end of the ram makes the



mark. A spring and collar with set-screw adjustment holds the marking tool clear of the work, and tapered sides of the form or anvil for the part allows ready removal of marked parts. Range of marking runs from approximately 15 1/16 in. characters in one line or 30 in two lines up to four characters ½ in. in one line.

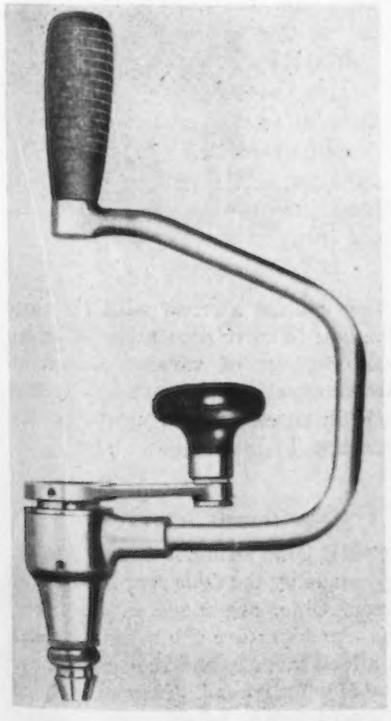
Torque Wrench

A NEW snap-acting torque wrench which gives both an audible and physical signal when the proper predetermined torque load is reached is offered by *Tubing Seal-Cap, Inc.*, 215 West 7th Street, Los Angeles. The wrench works on the principle of a

spring bar deflection. The deflection in the main bar bends a secondary spring which snaps over center when the proper load has been reached. This causes a slight drop in the torque curve, makes a "click" and actuates a button in the handle giving a physical signal in the palm of the operator's hand. Twelve sizes are available with open or box ends, either offset or straight.

Rivet Puller

A NEW ball bearing blind rivet puller is announced by *Whitney Metal Tool Co.*, Rockford, Ill. The puller has a capacity of ⅛, 5/32, and 3/16 in., weighs 4 lb. and has an overall height, with the brace handle, of 15 in. Interchangeable chucks are available for flush or brazier blind rivets. A wide variety of types of rivets may be applied with this tool without the use of a bucking bar.

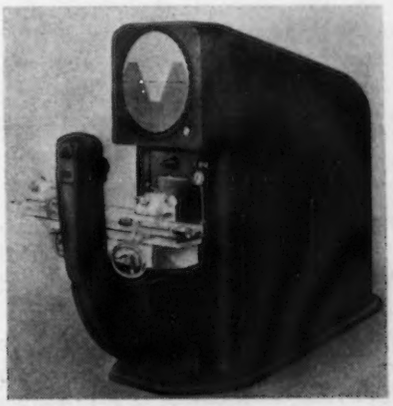


Magnifiers

STANLEY Fluid-Lite magnifiers, inspection tools that combine magnification and shadow-free fluorescent lighting, are manufactured by the *Stanley Electric Tool Division*, New Britian, Conn. Base and frame swivel joints and friction arm joints permit movement of lens to any desired position without moving base. A rotary light switch is mounted in the frame. Two models are offered—one for bench work and the other for portable inspection.

Optical Comparator

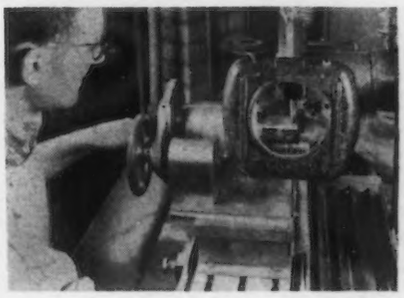
THE Model P-3 universal optical comparator manufactured by the *Portman Machine Tool Co.*, 17 Beechwood Avenue, Mt. Vernon, N. Y., offers many advance features. The wide field of the objective lens units used, in conjunction with the superior light obtained, with the microphotographic bulb constituting the optical system of the comparator, makes it possible to project large images clearly, with sharp outline definition and uniform light coverage over the entire screen area, it is



claimed. Work may be placed in various positions, with flexible movement in all directions. The stage travel measurement control devices permit precise readings to 0.0001 in. over the entire range. A graduated protractor screen is also included as standard equipment.

Magnifying Glasses

THE BOYER-CAMPBELL CO., 6540 Antoine Street Detroit, announces four new models of Super Sight adapted to close inspection, small parts assembly and precision machining. No. 95ZC Super Sight has two magnifying lenses (top lens 5 in., lower lens 4 in.), lower lens adjustable to proper focus. Lenses are lighted separately. Head is balanced

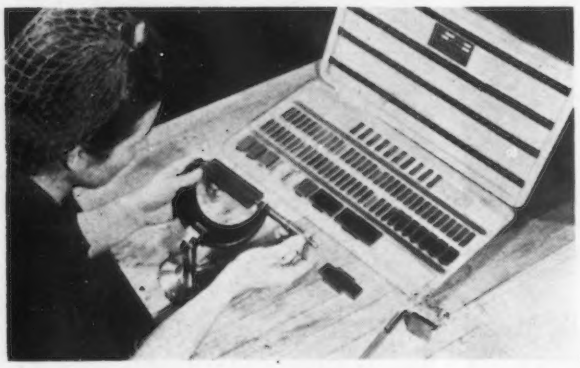


on bracket and can be instantly put in any position over a wide bench area. Model No. 89ZC has one magnifying lens 5 in. in diameter. No. 89U, illustrated, has one magnifying lens 5 in. in diameter, fitted with safety lens to protect magnifying lens when required. It is equipped with universal brackets. Model No. 44ZC has one magnifying lens 4 in. in diameter.

Comparator Gage

A NEW type comparator of high precision for convenient and accurate checking of large and small lots has been developed by *American Measuring Instruments Corp.*, 40 West 22 Street, New York. A displacement of the measuring pin of 0.001 in. causes the hand to move one full inch on the dial of 6 in. in length. Flat springs are used in the system. Each inch on the dial is subdivided into 10 lines, each division indicating 0.001 in. Deviations as small as 0.00002 in. can be detected with ease. Total capacity is ±0.003 in. A disk mounted on the axis of the indicator hand rotating in a permanent magnetic field brings the hand to immediate rest. In final setting a zero ad-

justment of the dial is provided. The comparator has a working height capacity up to 12 in., a throat depth of 4 in. and a working circle of 10 in. by swiveling the head.

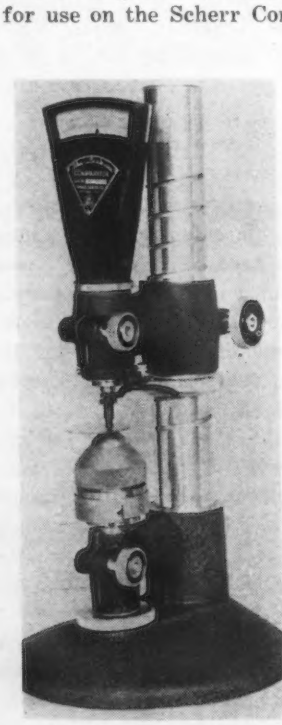


Gage Blocks

ANNOUNCEMENT has been made by the *Savage Tool Co.*, Savage, Minn., of the new Doall master gage blocks, designated as set 400 and consisting of 81 blocks, ranging in length from 0.050 to 4.00 in. Each gage block has its measuring surface lapped to a flatness of less than the quarter wave length of light and is produced with a mirror finish. The blocks are produced in AA grade (accuracy 0.000002 in.), A grade (accuracy 0.000004 in.) and B grade (accuracy 0.000008 in.).

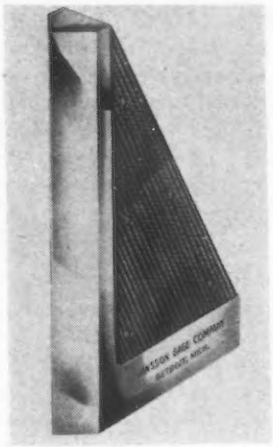
Ball Measuring Anvil

THE GEORGE SCHERR CO., INC., 128 Lafayette Street, New York, has developed a ball measuring anvil for use on the Scherr Comparitol to facilitate the inspection and measuring of extremely thin pieces, such as crystals, laminations, shims, and other flat work. The work is placed between the flat feeler point and the round ball surface and dependable results are obtained regardless of which part of the thin piece under inspection is being measured. The instrument may also be used to check the flatness or parallelism of long thin pieces in all positions and on all parts of the work.



Master Tri-Square

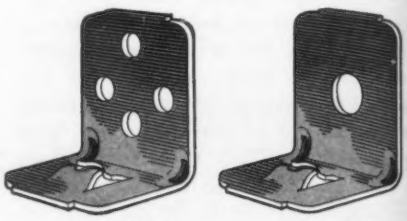
A MASTER tri-square has been produced by the *Jansson Gage Co.*, 19208 Glendale, Detroit. Of one-



piece solid construction, it is suited to extreme precision measurement wherever 90 deg. angles are involved. Held to limits of 0.00002 in. on base and side, the tri-square is available in two sizes: 4 in. in height with a ⅝ in. wide standing base and 6 in. with a 1 in. wide base. It is provided with an inset hard fiber serrated grip to prevent heat transference and slipping in handling. Vertical side edge is knife-sharp for truer visual gaging.

Bracket and Fastener

TO speed up angular attachments and reduce weight in aircraft and other war equipment, a line of new angle brackets with self-contained fasteners is now in production for non-structural attachments by *Tinnerman Products Inc.*, 2040 Fulton



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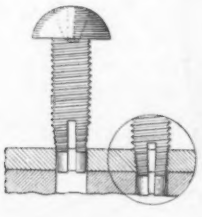
Road, Cleveland. The feature of the bracket is an integrally formed speed nut in one or both sides of the bracket,

6083

according to need. When used in connection with conduit and piping, this new bracket permits the use of standard bonding clamps in place of ear-type aluminum bonding clamps.

Tap Screw

THE CONTINENTAL SCREW CO., New Bedford, Mass., has designed a new tap screw which cuts threads accurately in correct alinement as it is driven in. A complete slotted opening at the entering end of the screw produces a self-cutting edge that closely simulates the cutting action of a tap. The spring or yield



action enables a screw with the same diameter to more accurately be driven into openings of varying diameters, providing self-adjustment by exerting a yielding pressure during the cutting operation.

Thumb Screws

THE Ohio shoulder thumb screws, made by the *Ohio Nut & Bolt Co.*, Berea, Ohio, are made in one piece. The shoulders are the same diameter as a lock washer, and the screws have a wide wing spread. They are offered in a wide range of standard sizes.

Helen of Troy, *U.S.A.*

This was in truth the face that launched a thousand American ships. She was so beautiful, so serene . . . and so damned uncomfortable!

Not alone from the bustles and the corsets and the voluminous billows of tent cloth. Daily her life was besieged with the drudgery and the discomforts of the Gilded Age: The flat iron, the wood stove, the wash tub and the carpet beater, gaslight and the coal grate, horsecars and hansom cabs. But all these things have changed . . . miraculously and wonderfully changed.

And that's the theme of this story: *Change!*

For today the world is changing faster than ever before, and the first 5 years after this war will be equal to any 25 years of the past. Because this is true, we at Jones & Lamson have an important story to tell.

We were already 50 years old when Helen of Troy was a girl. We began with the birth of the Machine Age in America, and even in the very birthplace. Many of the precision machine tools designed and developed by Jones & Lamson engineers during more than a century of the company's history have literally made possible much of America's industrial change.

Because of this background and reputation, Jones & Lamson engineers have actually been called upon by manufacturers — from the largest to the smallest — many thousands of times for counsel, service, or precision machine tools during a single year of this war!

If your business is manufacturing with metal . . . if you have problems today . . . and if you are looking ahead to the swiftly changing markets, products and methods of manufacturing after the war . . . Jones & Lamson engineers and service men can help you. They are at your call!

Universal Turret Lathes . Fay Automatic Lathes . Automatic Thread Grinders . Optical Comparators . Automatic Opening Die Heads

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Profit-producing Machine Tools

Assembly Line . . .

STANLEY H. BRAMS

• Further production curtailments sighted as war goods volume outstrips needs . . . Re-conversion toward civilian goods output comes closer . . . Henry Kaiser submits sub-jeep designs.

DETROIT — Further reductions of armament production are in progress and in the offing. The entire arms manufacturing picture is beset with an unsettlement somewhat like that which marks the stock market in the closing phases of a long upturn. There are indications that war production may be close to its over-all peak in many categories, that levelings-off are in order and that further advances will be extremely selective.

At the same time, circumstances point to the possibility that the Army is not letting its right hand know everything its left hand is doing. New facilities are still being set up in close proximity to parallel facilities which may soon go down.

Many ground fighting requirements already have been reduced once, toward the close of 1942. In spite of that move, it appears, output is still running ahead of the ability to move it overseas to the firing lines, and the manufacturing rate also seems to be well ahead of the battle destruction rate. Trucks, tanks, combat vehicles and ammunition largely fall into this classification.

On the other hand, shipping and aircraft requirements continue to mount and likely will so continue for the rest of the war. However, their acceleration cannot be expected to outbalance notably the forthcoming downturn in ground materiel for some time, simply because of the slowness with which manufacturing momentum is gathered on such projects.

Some industrialists are coming back from Washington with the expectation that many sizable government plants are likely to be closed by fall. This is in line with the often expressed policy of Ordnance to let the cut-back blows fall on government arsenals first, on large plants second, and on small companies last. The outline of curtailment ahead is further filled in by planning to close first those plants which lie in crowded labor areas and in sections of least accessibility. Private companies managing war plants can worry about walking in shoes of this pattern if the size fits.

The curtailments are so close at some points that ranking Army men have been holding private conversations with labor leaders to outline the developing situation and urge their support in explaining the picture to the rank and file of workers. That this is a difficult assignment goes without saying. For many months emphasis has been on more and more production, on elimination of excessive absenteeism, on getting out the work. After being made subject to such campaigns, the workers in the plants are likely to swallow lay-off news with extreme misunderstanding, not to mention distaste.

The situation naturally can be expected to alleviate tightness in the more common grades of steel and to ease problems in the alloy grades, though in lesser degree.

IT is an extreme pity in the light of these circumstances that the same signatures at the bottom of cutback orders are being used to approve semi-duplicating expansion orders. The evidence on hand indicates that tank output will be rather sharply cut back, perhaps centralized in a few plants rather than scattered thinly in many. Yet in one important tank production area facilities are being enlarged at this moment for the production of heavy armored cars and tank destroyers. Tanks, tank destroyers and armored cars have much in common. All require the same type of systems for heavy materials handling. All bear rough similarity in their assembly line methods of manufacturing and production. It would seem that inasmuch as tank output curtailments are immediately ahead that there would be a tendency in Army administrative circles in Washington to utilize these facilities as far as possible for alternate work, rather than building new lines and new plants.

Point is lent this thesis by the fact that national construction estimates for 1943 are figured around $3,800,000,000, against $5,500,000,000 in 1942, mostly for Army needs. The indicated 30 per cent curtailment, while large, still does not seem to be enough. Water has yet to be squeezed out of some of the planning.

Continued construction and facilities expansion at this time, when shutdowns are imminent, appear to be pointing toward the situation now obtaining in the machine tool field. The government, having seen to it that orders poured into the machine tool companies in the greatest magnitude in history, is now trying to halt the flood; first it gorged the machine tool companies and now it is moving to starve them. Inventories are being taken this week in industrial areas by WPB to find out how many machine tools are idle, and to what use they can be put. Preliminary indications are that the number of idle tools is large indeed. If final findings bear out those samplings, order cancellations on machine tool books can be expected to grow. That is the fact of the matter, however unpleasant it may be to read.

The government could save itself another experience of this kind by surveying anew the plants which the Army may soon be relinquishing and which could be put to uses for which new facilities are being set up.

Elimination of facilities as the war goes on is logical and to be expected; in itself it is not an indication of bad management. It stems from the prime fact that a mechanized war requires a vast stockpile of equipment on hand. Germany took a decade to build one; we will have done it in about two years. Some of the things we need are already stockpiled to sufficient size; from this point forward the only need is replenishment as the exigencies of war demand.

As War Production Board officials have recently put it, the question is one of filling the pipe lines leading from the arms factories to the battlefronts. Once these have been filled, once sufficient supplies have been laid down on the fighting fronts, once a steady stream of transport is plying between those fronts and the factories, then it becomes necessary only to keep pushing into one end of the pipe an amount equivalent to that be-

To Speed War Production

the 74" CUT MASTER IS AVAILABLE

The 74" CUT MASTER is available!!! Here's the BULLARD VERTICAL TURRET LATHE—largest size—on definite government instructions. A limited number of these machines are available for those plants whose work demands heavy cutting, high speeds, and a variety of operations.

20 speeds in each range for heavy work from 1.24 to 45 R.P.M. . . . For light metal, fast cutting, from 3.29 to 120 maximum R.P.M. with two other ranges between.

16 feeds in geometric ratio from .0026 to .500 per revolution . . . rapid traverse on all heads in any direction.

This CUT MASTER can be purchased with any combination of ram heads, right hand turret head, side head, and can also be equipped for thread cutting, drum scoring or angle turning in addition to the swiveling of main heads. Circular on request.

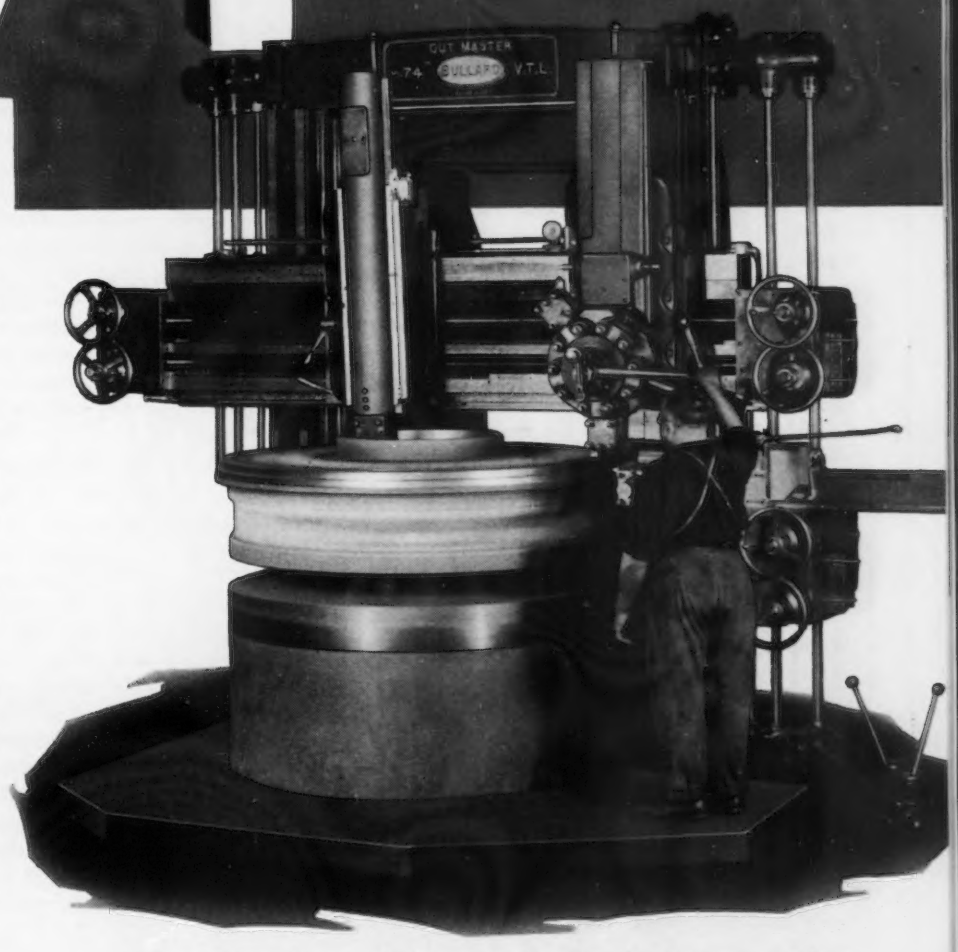


Photo above shows multiple operations in simultaneous cutting.

★ ★ ARMY E NAVY ★ ★

THE BULLARD COMPANY

BRIDGEPORT, CONNECTICUT

ing used up at the other end. This is a comparatively small job alongside the original task of filling the pipe.

Some sections of pipe will never be filled. The pipe labeled "naval vessels" will expand just as rapidly as our ability to feed it. The submarine war can be expected to continue right through to an armistice, necessitating constant increases in the size of our Navy, our escort vessels, and merchant shipping required for transport.

THE same holds true for aircraft. This is an air war and it is doubtful there will ever be too many planes, unless the unforeseen possibility arises that our factory production facilities will outstrip the speed with which pilots and aircraft crews can be trained.

In contrast to sea and air, land needs will be reducing. The procurement of shot and shell is a declining need today. Curtailment which began earlier this year will probably continue.

Manufacture of tanks has been on a reducing scale since late last year, and a glance at the battlefield reports tells why. We have produced around 4000 tanks a month and it is a large scale clash indeed which knocks out 100 or so. Obviously destruction is not keeping up to production; production, therefore, will diminish now that the pipe lines have been filled.

A similar thesis can be made out for trucks. Up until now, and until this summer, the manufacture of trucks has been required on an accelerated scale to match the increasing size of the Army. From summer on, it is likely that truck buying will be simply on a replacement basis, and replacement will be of far smaller dimensions than was original equipment ordering since 1940.

So, too, with field guns. Our fire power is still not at the level sought for it, but it is close to it and will likely arrive there sometime later this year. When that satisfactory state of affairs takes place, when we have enough guns to mount an offensive at any strategic point, then our factory production can be tapered off to supply replacements.

These conditions hold true not only for our own armed services, but for those of our Allies.

As a result, we are at the brink of a new situation in the home front planning of the war. We are close to the time when a conversion back from war material to civilian goods production will once more become possible.

Auto Parts Firm Sells Dust to Government

• • • Probably the most unique contract yet awarded in the automotive industry came to light this week.

The contract is for a prominent parts producer to furnish dust to the government. The dust is to be collected in Arizona and heavy portions are to be filtered out. The residue is expected to be the closest possible domestic equivalent of African desert sand, and will be used in the development of filtering apparatus.

DETROIT industrialists returning from Washington say the capitol is already beginning to think about this forthcoming state of affairs. There are indications that conferences will shortly be going on in Washington between WPB and prominent industrialists to talk over means of handling the re-conversion. Washington has twin motives in mind in calling such meetings, first, to insure that no idleness ensues after the huge bulk of war output and scratches at public morale; second, to provide civilian goods which already are beginning to pinch modestly in many quarters.

There are at least two viewpoints on re-conversion in the Administration. One, probably a minority viewpoint, would like to see it accomplished by progressively relinquishing the controls held over industry. To make a hypothesis, CMP would continue to apply where war goods were concerned, would not apply where civilian goods was concerned. The lessened overall volume of war requirements would leave available some small margin of steel and aluminum, possibly copper also, after arms production requirements were met. Companies doing civilian work would be free to scramble after these materials.

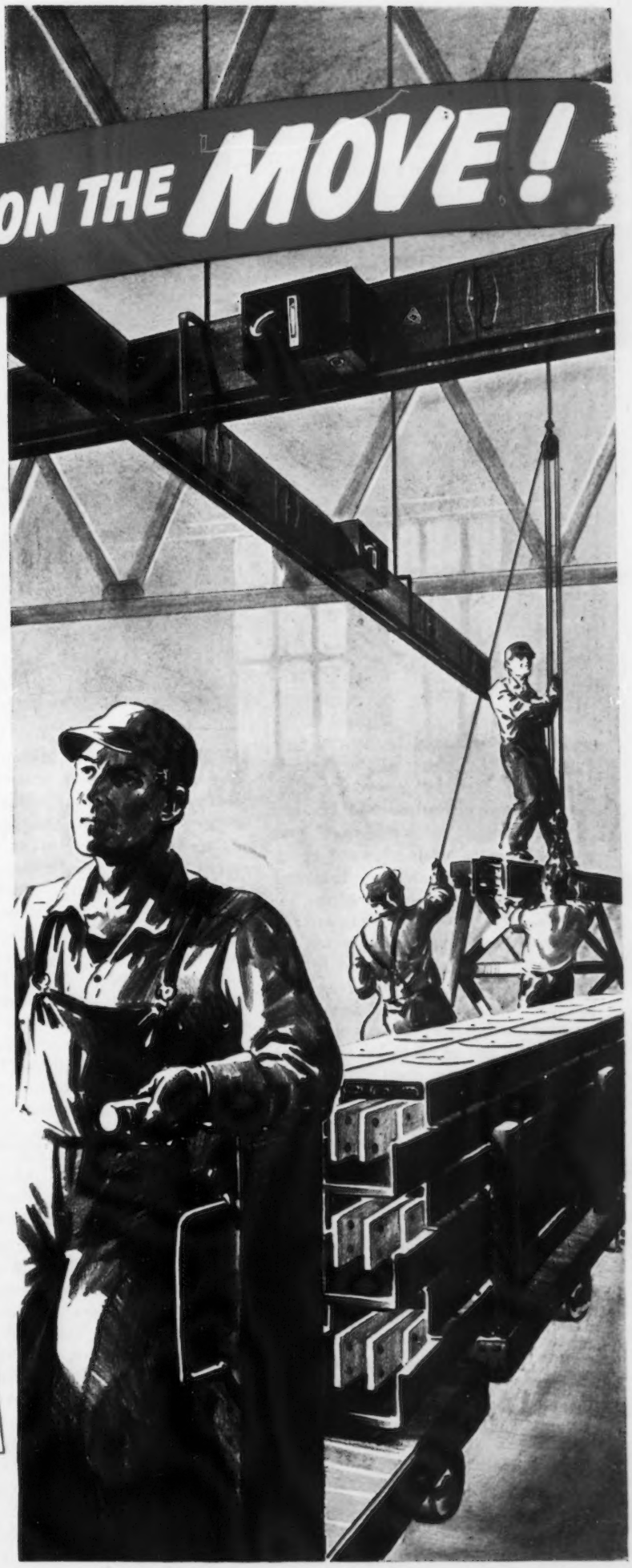
The majority viewpoint is that such a scramble would be exceedingly ill-advised. Perhaps at first blush this is a continuation of the planning programs which have characterized Mr. Roosevelt's administration; in another wider sense transition planning may be completely necessary. Quite obviously there would be a most unequal distribution of goods in an uncontrolled scramble staged while demand far overreaches supply. This majority viewpoint is that control is necessary not only for any civilian goods production during the war, but beyond the war as well, to insure orderly distribution until normal competition returns to manufacturing.

Any forthcoming war goods cuts and civilian goods enlargements will help diminish the manpower problem now weighing on the nation. However, in the very irregularity of the turn is embedded a problem; the layoff of men working on guns or ammunition at one point will do little to help the scarcity of aircraft workers at another. Up to now, it must be stated baldly, manpower shortages have been mostly on paper rather than in fact. The day has always been just ahead in nearly all plants, not at hand, when they become unable to operate at the limits imposed by schedules and materials because of inability to obtain enough workers to man the machines. Manpower shortages "around the corner" can be expected to be pushed farther down the street by the cutbacks and the reconversions.

SHIPBUILDER Henry J. Kaiser has added Detroit to his great circle tour of American industry. His objective was to interest the Tank-Automotive Center of Ordnance in ideas he had for a baby jeep; he proved a successful salesman. Specification writing for an experimental model is being rushed.

The new vehicle, if it is approved, promises to be a hybrid born of the jeep on the one hand and the German volkswagen on the other. The jeep is fairly well known. Its German counterpart, described, will serve to outline the direction the Kaiser planning is taking. The volkswagen has a 16-hp. motorcycle type motor, is about two-thirds of the width of the jeep and sits lower on the ground, weighs little more than half of the jeep's 1900-odd lbs. Its size is something Ordnance would like to duplicate, but in all likelihood its fragility (thin plywood paneling over the powerplant, for instance) and its weak powering will be bettered in any forthcoming American model.

Typically, the Kaiser visit stirred interest, apprehension, bandwagon-jumping and criticism in Detroit. Say what you will about the construction engineer-shipbuilder-aircrafter-neophyte automan, he stirs up a flurry in his wake.



Bus Duct always ready for quick layout changes

A southern plant, chin-deep in war orders, needed power circuits for a new department —*in a hurry*. Schedules couldn't wait for delivery of new equipment. What to do?

Bus Duct solved the problem. A 200-foot run of 20 standard 10-foot sections was moved overnight from a less important department. It filled the gap — production went on.

One of the great advantages of Bus Duct is its adaptability to any manufacturing set-up.

Built in standard, interchangeable sections, it can be used and re-used, and represents a *minimum* use of critical materials consistent with sound engineering. Plugs for individual machines can be moved or added at will, or whole sections of duct can be shifted to new production layouts.

Great industries have gained precious weeks—even months—on vital war contracts by installing Bus Duct. They have saved countless man hours through *continuity* of operation. They have cut maintenance costs to the bone.

BUY MORE WAR BONDS • SALVAGE ALL SCRAP METAL

Send for descriptive Bulletin No. 427

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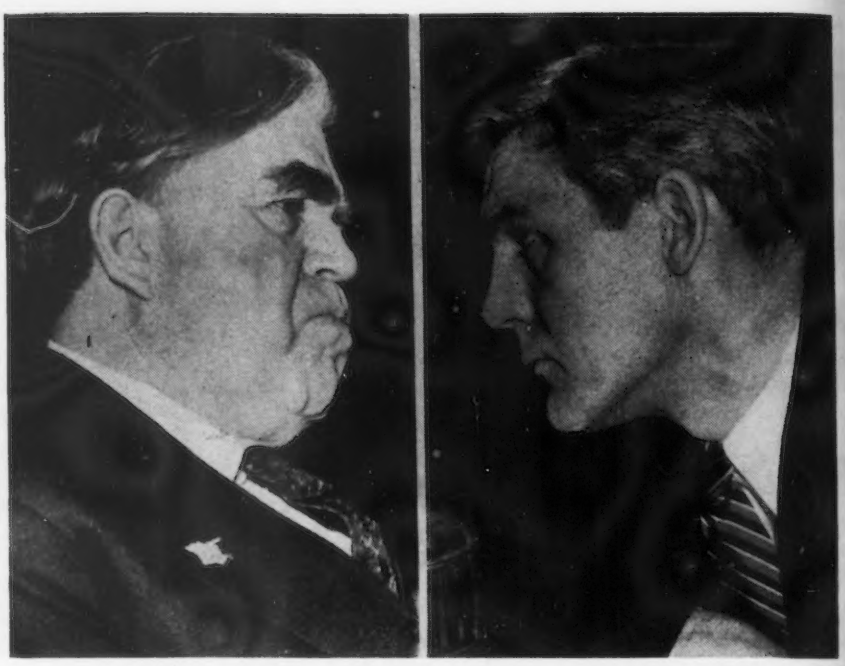
Field Engineering Offices in All Principal Cities

MANUFACTURERS OF Vacu-Break Safety Switches, SafToFuse Panelboards, Circuit Master Breakers, Switchboards, Bus Duct Systems — FOR LIGHT AND POWER.

Washington . . .

L. W. MOFFETT

• 48-hr. week seen headed for trouble in steel . . . Truman labor report called "milk toast" . . . Component scheduling hits snags . . . CMP earns more criticism.



FACE TO FACE: John L. Lewis (left) and Senator Joseph H. Ball (R-Minn.) as they appeared during heated discussions of the mine chief's testimony before the Senate War Investigating Committee.

WASHINGTON—When the 48-hr. week went into effect last week, five steel producing districts were under the War Manpower edict. The companies in these areas produce an estimated 28,000,000 tons of steel, or 30 per cent of the nation's output. The districts are Gary, Chicago, Baltimore, Buffalo and Detroit.

Indications at midweek were that some companies at least were going to appeal to War Manpower Regional Directors for exemptions from the 48-hr. rule. One reason for this is that employees have already started to balk about upping production in the added work time. Another reason is that new reports from steel companies say that the industry is not convinced that a work period of 48 hr. is needed to insure maximum steel production. They point out that production is moving steadily along at approximately 100 per cent of or above rated capacity and has been for weeks.

Charles P. Randall, vice president of the Inland Steel Co., told the House Military Affairs Committee, at a hearing last week on the "full utilization of manpower" that workmen have threatened to produce no more in 48 hr. than they usually do in 40. Mr. Randall said that shortly before he left for Washington he was informed that a group of workmen in the Inland roll shop where rolls for the mills are made refused to make more rolls in 48 hr. than they did in 40.

MR. Randall's testimony drew a blast from Philip Murray, president of the CIO-United Steelworkers, who, in a letter to Chairman May of the Military Affairs Committee, challenged Mr. Randall's statement that workmen had threatened to do no more work in 48 hr. than in 40 hr.

His ire aroused, Murray said that recent production records of the workers at Inland "deserve commendation and praise," and not "snide remarks from Mr. Randall who has resisted the efforts of this (USW) organization to establish close relations with the company through a labor-management production committee in order to assure maximum production of steel." Claiming that the USW has been in the forefront throughout the war period in sponsoring every possible effort to increase production, Murray said that the USW a week previous had formally required the WPB Steel Division to place the entire steel industry on a 48-hr. week.

The Inland Steel Co., he said, in a case before a panel of War Labor Board testified that it expected to produce 250,000 tons of steel less in 1942 than in 1941. The USW, Murray said, took exception to "this cold-blooded statement and urged that through the use of a labor-management production committee in the plants of the Inland Steel Co. this tragic decrease in steel could be avoided and rather an increase in the steel production in 1942 could be obtained."

Murray proceeded to say that Inland employees have established several production records, and cited the following figures:

"At the No. 1 open hearth at the Indiana Harbor plant of the Inland Steel Co., for the month of February, 73,997 tons were produced—greater than in any previous February record in the history of the company. For the month of March, 85,000 tons were produced—greater than in any month in the history of the company.

"On Feb. 23 of this year, 6199 tons were produced in the blast furnaces which broke any previously established records for this company. On March 30 the 76-in. hot strip mill broke all-time records for any consecutive 28 days of work.

"In the open hearth department the men are working six days on and two days off, which means that they work only two weeks out of every eight on a 48-hr. week schedule. The blast furnace schedule is the same. The workmen of Inland Steel are demanding a 48-hr. week so as to increase production—so as to get the absolute maximum of production—but they cannot get it."

Meanwhile, more labor news was being made by the Senate (Truman) Committee. The Committee issued a milk toast report on labor on April 2, which was filled with "broad objectives" in that it undertook to scold labor mildly for jurisdictional disputes and other faults. UMW President John L. Lewis was singled out for an individual spanking.

THE Committee called upon leaders of organized labor to "demonstrate that they are statesmen and patriots as well as paid advocates for worthy causes." The report announced that labor has come of age, and that the country expects union leaders to

New Twist to Old Idea

PRACTICALLY DOUBLES PRODUCTION

Many types of milling operations can be completed faster by employing the familiar reciprocating method, with a fixture at each end of the table. While one part is being milled, the fixture at the other end of the machine table can be loaded and unloaded. The limit of production increase will be realized where cutting time and handling time are approximately equal, for then the machine will be cutting continuously.

This idea can often be employed when two operations are required on the part. An example of this type of set-up is illustrated above.

Two slots are milled in liner sleeves, one in the left hand fixture, and the second operation in the right hand fixture. In this manner, two distinct milling operations are completed each cycle and the machine is cutting continuously. A CINCINNATI No. 0-8 Plain Automatic, equipped with fixtures designed by CINCINNATI Service Engineers, does the job.

It's time to retool for higher production, and CINCINNATI Service Engineers can help you do it. Meanwhile, if you would like to know more about the efficient and rapid 0-8 Millers, look at our insert in Sweet's Catalog File, or write to us for a copy of Specification Catalog, M-964-1.

Right: CINCINNATI No 0-8 Plain Automatic Milling Machine equipped with Automatic Rise and Fall Spindle Carrier

CINCINNATI

THE CINCINNATI MILLING MACHINE CO. CINCINNATI, OHIO, U.S.A.

TOOL ROOM AND MANUFACTURING MILLING MACHINES... SURFACE BROACHING MACHINES... CUTTER SHARPENING MACHINES

recognize that labor has duties as well as rights. The report was full of corny political caution, typified by the following:

"Labor must not repeat the mistake of arrogant capitalism, which forged the shackles that now restrict its every act."

The final punch paragraph was a masterpiece of mealy-mouthed semantics, a fine example of politically fearful criticism. It follows:

"The Committee urges labor leaders to make every effort to end strikes, jurisdictional disputes and improper action of every kind. They would thereby present the most convincing answer to the enemies of labor who insist that labor is irresponsible and must be subjected to stringent legislation. Many labor leaders have recognized this and have sought to effect it even at the danger of impairing their prestige and position with their own organizations. Such leaders are to be commended. Their examples should be followed."

"Lewis," the Committee averred, "has hinted but not quite said that he reserves the right to determine whether government has performed its full duty to labor and that in the event he should determine that it has not, he is free to lead the coal miners to a strike which would cost the nation between two and three million tons of essential coal per day."

The conclusion of the report was the obvious observation that no citizen has the right to jeopardize the nation's existence in war time, not even John L. Lewis. It is doubted that this panty-waist handling of the intractable John L. Lewis will make him violate the "no trespass" sign on coal operators' properties.

CHARLES E. WILSON, WPB Executive Vice-Chairman, has run into some grief on his new scheduling of critical components. When the scheduling scheme was put into effect, there was to be no attention paid to other priorities. Scheduling orders were supposed to insure material delivery by not being subject to any present material control.

Now, Mr. Wilson is discovering that when he orders production according to shop capacities and without reference to supply of particular steel products such as sheets, tubing and bars, manufacturers have found themselves unable to fill his orders. The reason is that undue demands have been placed on supplies of these products by faulty production ordering, with a resulting shortage. It is reported that Mr. Wilson found this disturbing and is trying to find a remedy for this in the WPB Steel Division. It is predicted that product shortages will be met by scheduling within the Steel Division of the products mentioned similar to the plate scheduling now in effect. However, it is pointed out that if capacities in these products are increased the upshot will be less steel for other purposes, of course.

The overall effect will be to bring more confusion both to mills and manufacturers who will have to adjust their schedules. Whole programs may have to be retarded as a result of the new drive on components.

RESTRAINT employed by this column in not criticizing CMP must be lifted somewhat in view of the administrative troubles in which WPB and the Claimant Agencies have found themselves involved. Everywhere consumers are complaining that they have not received their allotments of materials for the second quarter — that they are having to scramble to secure materials. Some allotments have been so late that mills have been unable to schedule the orders of many companies. Furthermore, allotments, when they have been received on time, have been unbalanced, that is, varying percentages of the amount of metal required have been allotted. The result is that programs will be governed by the smallest percentage received. Critics say that this is an inevitable result of "marrying" three metals under a distribution system and that each should be divorced and controlled separately.

To illustrate the foregoing, one WPB official reported that an aircraft manufacturer brought him his allotment for the second quarter. While he secured an allotment for 98 per cent of the alloy steel, he only got 78 per cent of the carbon steel. Copper allotment was 13 per cent short and on some items in aluminum the allotment was as much as 43 per cent short of what was needed to fulfill his contract and schedule.

OF course, the manufacturer got his troubles straightened out and was given 100 per cent of all three metals, but it means that other manufacturers in other programs must take correspondingly less for the less essential items.

The WPB official explained that the naval officer who allotted the materials had no authority to cut schedules back.

THE BULL OF THE WOODS — BY J. R. WILLIAMS

BOY, IS THAT GUY INDIGNANT! HE'D LIKE TO THROTTLE ME--I TOLD HIM HE'D DROPPED ONE OF HIS HITLER HELPERS!
THAT'S ABOUT RIGHT, TOO --HE TOOK IT OFF TO RUB HIS NOSE AN' PUT IT ON TO TAKE TH' TOOL... TOOK IT OFF TO REACH IN HIS POCKET... PUT IT ON TO PICK UP TH' DRILL AGIN... TOOK IT OFF TO PUT TH' TOOL CHECKS BACK IN HIS POCKET.... PUT IT ON ....
T. M. REG. U. S. PAT. OFF. COPR. 1943 BY NEA SERVICE, INC.
J.R.WILLIAMS
THE HOLDUP MAN
4-9

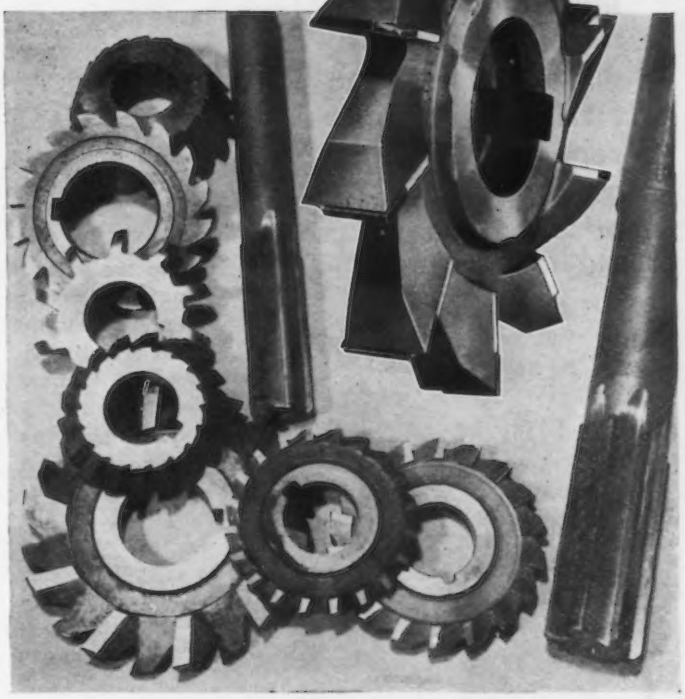
Reclaim Your High Speed Steel Cutters

By Brazing-on STANDARD CARBIDE BLANKS

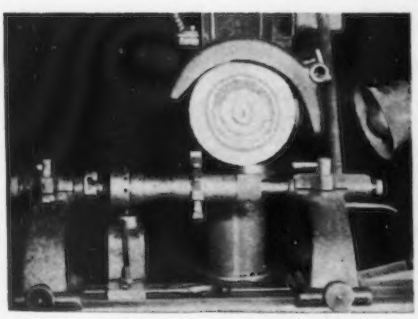
When your high speed steel cutters are "worn out", don't scrap them. They usually can be reclaimed by simply torch-brazing standard carbide tips to the cutting edges of your cutters.

Standard styles of carbide tips are readily available to meet practically all carbide tipping requirements for all commonly used types of high speed steel cutters. With a small master stock of standard tips in your crib, you'll be prepared to reclaim and re-tool fast.

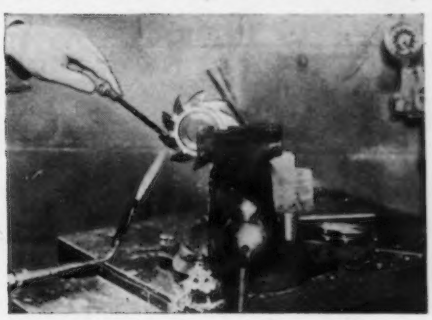
Complete instructions on request.



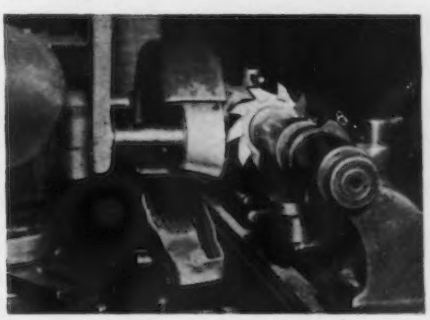
THREE EASY STEPS AND YOUR OLD CUTTERS ARE RENEWED



1 First grind a recess in the faces to which the carbide tips are to be brazed. Plan recess so that tips will project slightly over edge—for grinding back to size. Bottom of recess should be ground flat surface but not necessarily smooth.



2 Using an oxy-acetylene torch, flux, and silver solder, braze standard carbide tips in place. Process is essentially the same as regular braze for carbide tools—except braze should be completed fast to prevent oxidization and loss of chrome.



3 Grind carbide tipped "high speed steel" cutter in same way you regularly grind any carbide tipped cutter. Cutter is now ready for many times life of the original. When again worn, you can often resize using same process.

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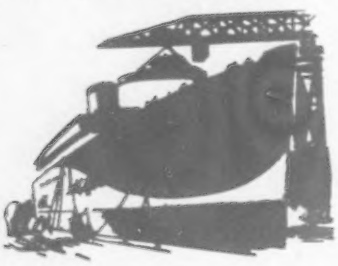
WEST COAST . . . .

OSGOOD MURDOCK

• WPB and aircraft companies push large scale material swaps to offset distance from suppliers . . . No steel shortage except alloys in Los Angeles area . . . Fixed price contracts, cost-plus-a-fixed-fee both cut aircraft profits.



LOS ANGELES—Born of wartime necessity for quickly acquiring key war materials on short notice, and spurred by this big industrial area's remoteness from most sources of supply, two agencies designed to provide a communal exchange of material have quickly acquired strong roots.

The big airframe manufacturers of southern California — Consolidated Vultee, Douglas, Lockheed-Vega, North American, and Ryan—operating under the banner of the Aircraft War Production Council, Inc., have interchanged material as well as engineering data on a wholesale basis. The Council's real effectiveness, however, has been sharpened to a great extent through standardization both of plane models and components. Standardization of the Boeing B-17 Flying Fortress as a heavy bomber model with contracts distributed among several companies, for instance, has made possible exchanges of this type: Vega needed five sets of landing gear forging drag links for Flying Fortress production, and got them from Northrup. Northrup needed, sometime later, small half pound aluminum forgings used in cowlings for the Fortress. Vega sent them 2500. Recent affiliation of Boeing with the Council will, no doubt, further facilitate the interchange of production data on this model, considerable of which has already taken place, but cannot have as much effect in the interchange of material and parts because of the 1000 miles which separate Seattle from Los Angeles.

Performing somewhat the same function as a clearing house for material among the hundreds of smaller Los Angeles manufacturers, most of them making aircraft components, is WPB's Redistribution Division which has carried an extremely heavy burden in the past few months. Usually demands levied upon it are of an emergency character by a firm located far from its source of supply. Mission Bell Radio Corp., which makes screw machine products, found the quarter inch brass tubing which had been shipped from an eastern mill to fill its order was too soft. A request was filed with WPB at 4 p. m. Friday and usable material was in the plant by noon Saturday, averting the shutdown which would have occurred had the material awaited shipment from an eastern mill.

Most of the surplus inventories listed with the Redistribution Division district office here—20,000 of the 25,000 inventory cards on file—are unfabricated metals. On a typical day last week, some 14,000 tons of surplus steel were listed, most of it merchant items, which, in normal times, is considered quite a handy tonnage for a West Coast hamlet. Of this tonnage some 1885 tons were in plates, 2350 tons in carbon bars and flats, 450 tons in alloy bars and flats, 1770 tons in angles, 970 tons in channels, 820 tons in stainless sheets and 665 tons in stainless hexagonal bars. Those are just a few of the larger items.

D. L. Sullivan, who runs the WPB redistribution show locally, sticks his neck out far enough to say, "If people were completely honest in reporting shortages, we would find that no material shortage exists in this area, except, of course, in chrome-moly and special alloys." Those words may be a bit brash, but even to hear them is a welcome relief from the talk of steel shortage which was universal in these parts a few months ago.

All of the 20,000-odd metal listings have been obtained voluntarily, but check is being made against the Steel Recovery Corp. records for this area, which nearly any manufacturer can tell you are acquired by the dire threat and big club method, to show up any discrepancy.

Recently cancellation of contracts, to some extent due to labor shortage, has contributed materially to the WPB list. Although the large firms cooperate well, the services are of special benefit to the thousands of backyard manufacturers whose inventories are less flexible. Measured by a statistical yardstick, the office has had 25,000 telephone calls since Dec. 1, resulting in 2000 requests for material, comprising 8000 different items. Forty-two per cent of these requests were filled, 95 per cent of them with material located within this area.

Possibly a sign of the times, the WPB Redistribution Division here now is keeping an eagle eye to thwart some manufacturers who would like to stockpile material so that when the war is over they will be able to get the jump on competition and be ready to go to work. WPB controls have them pretty well stymied, however.

Some of the steel plate stock is in the form of "fishtails," remnants as long as 6 ft. from the big shipbuilders like Calship. These represent usable material to small fabricators cut off from purchasing stock size material in many cases, and thus results in holding down the sale of new material and also in salvaging scrap.

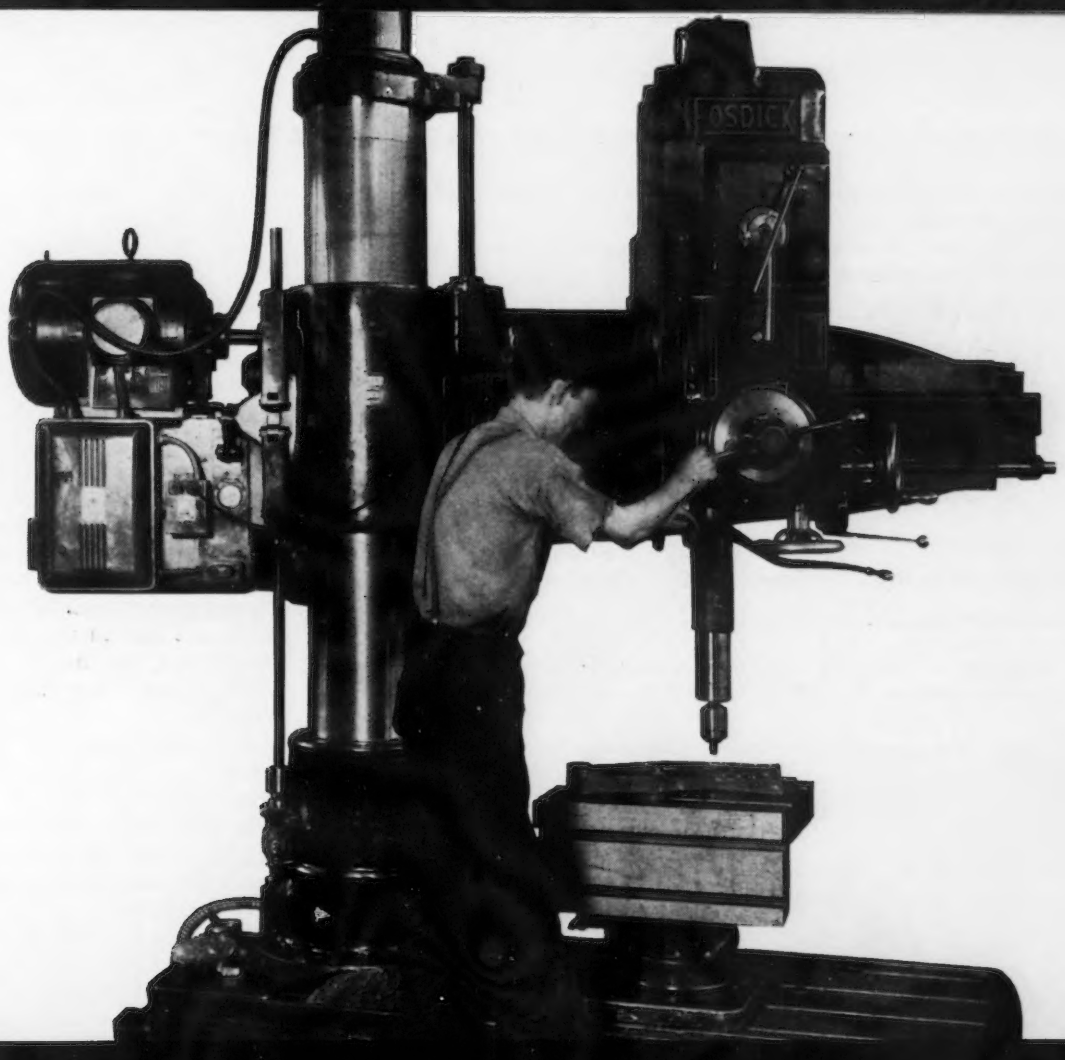
Like the Aircraft War Production Council exchanges, much of the material is "borrowed" because of the large number of manufacturers doing comparatively the same type of work. These loans are repaid when delayed shipments come in.

THE Aircraft Council, incidentally, issued one of its semi-annual reports last week which reduced to conformity with censorship regulations a number of interesting, if not hot, stories of industrial cooperation. According to this emasculated report, the Council has done the following:

Exchanged 2205 technical engineering reports, representing 502,400 man hours, most of which would have been regarded as confidential trade information during normal times, and probably much of which was disgorged, even now, only upon government insistence.

Arranged, in more than 40 instances when machinery broke down, to have production work assumed by another plant until repairs were made.

Coordinated manufacture of spare parts with manufacture of planes so that critical spares are now delivered



MORE AUTOMATIC SCREW MACHINES FOR *"All Out"* PRODUCTION

FOSDICK *Hydraulic* RADIALS

As we broaden our fighting fronts around the globe, ammunition, small arms, cannon and mechanical equipment becomes more vital than ever.

Here a Fosdick Radial is drilling and reaming steel castings used in making Automatic Screw Machines to help produce more of these vital materials—faster.

The wide range of feeds and speeds—all controls conveniently located on the head—the full hydraulic circuit for manipulating controls are features that make for ease of operation and versatility.

No matter what your drilling, reaming, facing, tapping or boring operation may be, if it can be done on a Radial you can do it easier, better and at less cost on a Fosdick.

ARMY E NAVY

For full details of construction and operation ask for Fosdick Radial Bulletin R. A.

FOSDICK MACHINE TOOL COMPANY
CINCINNATI · · · OHIO

to the fighting fronts simultaneously with complete aircraft.

Established a pool on dimensional integrity which has reduced the necessity for hand-tailoring of parts at assembly.

Worked out substitute processes for aluminum extrusions because of the critical shortage of existing extrusion facilities.

Exchanged complete data on 14 major tooling problems, common to all plants.

Exchanged information on malfunctioning of both government furnished and contractor furnished equipment.

Handled Controlled Materials Plan on an industry basis, putting the bee on CMP authorities for adjustments of required procedure.

Established an industrial training method pool, including a training film library, and even—God bless Hollywood next door—produced training films.

Set up controls, in cooperation with the federal government and to a great extent at the government's instigation, over turnover, absenteeism, and losses of irreplaceable personnel to the armed services.

Established the southern California employee transportation plan, under which mileage rationing for workers is handled through plant site administration. This was necessary because automobile transportation, necessitated by the sprawling city and its suburbs, forms such an important part of the total worker transportation picture.

Arranged emergency exchanges of production items between member and non-member firms numbering 20,022, including everything from nuts to pins to aluminum sheet.

NOTHING was said about it in the Council's report, for obvious reasons, but probably one of the outstanding achievements was the independent stand taken by Council members as an industry unit in hearings leading up to the recent WLB labor stabilization ukase. Trend or not, it indicates that employers can effectively organize for concerted action just as well as employees.

The stabilization order, incidentally, has been ordered put into effect, by the new West Coast Aircraft Committee which is charged with its administration. The stabilization order provides that if any dispute arises over the application of the order, it shall be resolved by established people procedures where they exist. In the absence of such procedures or failing settlement by them, the disputes ultimately are determined by the committee. Earl J. Miller, dean of undergraduates and economics professor at the University of California at Los Angeles and public member of the committee, has been chosen its chairman.

The specter of contract renegotiation haunts the annual report of Lockheed Aircraft Corp. for the fiscal year ended Dec. 31, released last week. Sales for the year amounted to $491,160,470, with production of planes and spares representing a three-fold increase over 1941. Indicated net income after provision for taxes, provision for the company's offer to reduce prices $30,927,180 under renegotiation of contracts, and provision for contingencies and post-war adjustments amounted to $8,163,-721. This basis of renegotiation represents the company's offer, countering an unacceptable basis suggested by the government. Thus the negotiations are still in progress, with final results not determined, and the final income figure may be trimmed further.

President Robert E. Gross indicated that most of the 1942 business of the corporation and its subsidiaries was done under fixed price contracts which, he said, the Lockheed management fundamentally prefers to cost-plus-a-fixed-fee.

This policy is diametrically opposed to that af Douglas Aircraft, Inc., which recently reported that it was accepting an increasing proportion of cost-plus-a-fixed-fee contracts, but that the fees had progressively been lowered, resulting in a decline in earnings. Apparently the shoe pinches either way.

MUTT AND JEFF: Here's a view of the Boeing (B-17) Flying Fortress and its kid brother, the Boeing (PT-17) Kaydet Primary Trainer.

British-Combine

War Department Authorizes Six Construction Projects

• • • **The War** Department announced March 31:

Authorization for construction of an Army General Hospital in Placer County, California, to cost approximately three million dollars. Construction will be supervised by the Sacramento district office of the Corps of Engineers.

Acquisition of a leasehold interest in the Wesley Hospital, Kansas City, Missouri, for use by the surgeon general.

Award of a contract, in excess of two million dollars, to M. J. Boyle & Co. of Chicago, for construction in connection with expansion of an Army Air Forces installation in Greene County, Ohio. Work is being supervised by the Wright Field district office of the Corps of Engineers.

Award of a contract, in excess of one million dollars, to Algernon Blair of Montgomery, Ala., for construction of buildings with utilities, at an Army General Hospital in Floyd County, Georgia. Work incident to this project is being supervised by the Atlanta district office of the Corps of Engineers.

Authorization for construction in connection with expansion of an Army Air Forces installation in Grant County, Washington, to cost in excess of three million dollars. Construction incident to this project is being supervised by the Seattle district office of the Corps of Engineers.

Authorization for construction in connection with expansion of an Army Air Forces installation in Kittitas County, Washington, to cost approximately one million dollars. Work incident to this project will be supervised by the Seattle district office of the Corps of Engineers.

Last Fall a civilian engineer and an ordnance expert buckled down to a triangular problem: How to eliminate screw machines, die castings and a critical metal in the making of tail fins for 81-mm. mortar shells?

Sheet steel soon gave them the answers to all three questions. With little fanfare, they designed a tail fin to be made from drawn steel cups and formed steel stampings. Casting materials and boring machines were conserved for other vital uses.

Even more importantly, they diverted enough of the scarcer metal on one procurement order to build 100 big bombers!

An achievement? Yes, and there are scores of others like it—with many more to follow. It's second-nature now for designers to be on the alert for conversions from machined parts to stampings, and from critical alloys to sheet steels.

Are you keeping a war-winning eye on redesign ideas —or thinking of peace-time products that will *sell?* Let us go to work with you. Whatever your sheet-steel needs, it is likely that one of ARMCO's special-purpose sheet steels can fill the bill. Just write to The American Rolling Mill Company, 1111 Curtis Street, Middletown, Ohio.

SPECIAL PURPOSE ★ ARMCO ★ SHEET METALS

THE AMERICAN ROLLING MILL COMPANY

Fatigue Cracks

BY A. H. DIX

Emporia Jones

Your Mar. 25 item on General Somervell struck a chord and I couldn't resist:

Somervell was surprised as hell
In fact, 'twas enough to floor ya
To find in there
In the house of prayer
A monk named Jones from Emporya.

He met a monk from Emporia.

Mikes and Manicures

• • • Once we lost one member of this page's loyal army of eighteen readers because we spelled "hell" right out. But as the ice has been broken, we will keep right on. This was written by Michael Hatch, who works in American Locomotive Company's Auburn, N. Y., plant:

There's lipstick on the drinking fount,
There's talcum on the bench.
There's cold cream on the surface plate,
Hand lotion on the wrench,
And "Evening in Paris" scents the air
That once held lube oil's smell.
I just picked up a bobby pin,
Believe me! War is hell!

Aptronym

Some time ago I wanted a new power line installed. The gentleman from the Consolidated Edison Co. (in the Bronx) who called to talk things over was Mr. Current. Is that a good aptronym?

—*Walter P. Garrick*

Good, hell. It's perfect!

Pro Patria

• • • When Fairchild Engine's head man, J. Carlton Ward, returned from England, he said:

> *Every worker in England acts as if the outcome of the war depended upon his individual efforts.*

As everyone works in England, we interpret the word "worker" as applying to every Englishman. If it is true, as Mr. Ward implies, that the average Englishman is putting the interests of his nation above his own, while here the get-it-while-the-getting-is-good attitude is still regrettably not rarer than a day in June, we can only look on in envy and puzzle over the reason.

Certainly in normal times the average Englishman assays as high in self-interest as we do here. And we doubt that the English are inherently more patriotic than we are. Therefore, England's catharsis must be due to the immediacy of danger, the awareness of war. In England, the war is next door or right overhead. Here it is six or seven thousand miles away.

While we can win the war without a national purge of self-interest as England has had, obviously the more we tend to question each action with "Will it help win the war?" instead of "What will I get out of it?" the sooner the war will end. One way of attaining that desirable state of mind is to read soldier's mail. As an example, we submit a letter received by one of the girls in the office here from her brother who is a tank gunner in North Africa.

He was among the first to land and was in the November fighting. Because of distinguished services, he and his crew may be cited. He personally was offered a promotion and a berth in a non-combat area. He tells why he rejected it:

For a better understanding of what influenced my decision I suggest you read articles such as "Stuka Horror over Greece" and "This is Starvation," in the December ***Reader's Digest***, and other eye witness accounts of Nazi brutality.

Fortunately, I've kept my morale sharpened with evidence of the violations they have committed against humanity and against my own personal ideals. I say fortunately because it tends to give the calmest of men a fierce determination to ***make them pay***. By continuing at my job as gunner I am in a good position to ***make them pay***.

They owe a lot to liberty-loving people all over the world, but the debt will never be settled if too many shirk their obligations and duty. When I made my decision to return to the front I made it with a complete knowledge of what was at stake, and with a confident faith that I would emerge a winner. My decision is not conducive to regret. Regret, in my opinion, is reserved for those who can't make their way along the paths their decisions lead to. No matter how many obstacles there are along the path, it can never be conquered by turning back, or wishing you hadn't come. That, dear sister, is my answer to you and all who ask a similar question with regard to promotion.

—*Bernie*

Down Went the Curve

Which reminds us to mention that Ryan Aircraft credits a drop in absenteeism to the publication of a chart showing that attendance was highest on pay-days and lowest on Saturdays and Sundays. It was headed, "Don't Show This Chart to Your Friends in the Service."

Diapers and Drill Presses

• • • We heard one of the WPB big shots say recently that he thought fears of a great manpower shortage were unwarranted. Now we know why. A War Manpower Commission release informs us that Robert F. Kopas puts in 10 to 12 hours a week doing actual commercial work on a drill press and other machinery in the basement of his home at 9710 Rosewood Ave., Cleveland. Robert's age is 4. His father, who is with Fenn College, is a consultant on the Training Within Industry program.

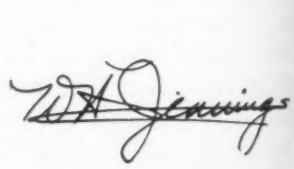
Although Robert's sister, Jacqualyne Rose, 21 months old, is not yet old enough to run a machine tool, she is no loafer. She sits on a work bench doing light assembly work on a wage earner test board her father markets, it says right here in the press release.

We know of a certain 3½-year-old, red-headed ne'er-do-well whose contribution to the war effort is absolutely nil. Let his wealthy father be warned that he is deceiving no one by permitting the child to appear busy by hammering nails in a chopping block and drilling holes in kindling wood. The WMC has been notified.

He Signs and Unsigns

Speaking of signatorial idiosyncrasies, W. H. Jennings, of the Reznor Mfg. Co., writes his name and then crosses it out.

—*Ira A. Thomas, President, Meek & Thomas, Inc., Youngstown, O.*



Dots and dashes are sometimes added to signatures for pure love of ornamentation or to attain distinctiveness. Other times the added strokes are employed in the hope that forging will be made more difficult. This isn't so. The highly individualistic effect is the easiest to copy. Forgers have most trouble with simple, unfurbelowed signatures.

Puzzles

This is going to press before we have had time to hear from the master minds regarding last week's Bren gun problem, so the answer will have to wait a week.

Henry Leonard, of the Advertising Dept., couldn't sleep until he figured out this one that he saw done at a party:

A guest took the 13 cards of a suit, held them in a pile in his hand, face down, and began to spell A-C-E. As he pronounced each letter he took a card from the top of the pile and placed it on the bottom. The next card he turned up. It was the ace, which placed face up on the table. Then he spelled T-W-O, again turning up the next card, which was the two-spot. This also was placed face up on the table. He next spelled T-H-R-E-E, turning up the card following the second "E," and continued right through to the king. Your job is to figure out the arrangement.

Northern SUPER-CRANES

MATERIALS HANDLING CAN'T BE SUBCONTRACTED

If a lathe, shaper, milling machine or other tool breaks down you may be in serious difficulty. But work can be subcontracted —ways found to meet the emergency.

But if a crane breaks down, the shop it serves is tied up until repairs are made. Materials Handling is one job that *can't* be subcontracted. You *have* to have reliable cranes for the heavy load of war production.

NORTHERN USERS HAVE ASSURANCE OF RELIABILITY IN THESE EXCLUSIVE FEATURES:

1. Rigid one-piece welded steel trolley construction.
2. Transmission type single unit, oil tight gear reduction.
3. Easily removable gear case covers. Splash lubrication of gears.
4. Heavy section girders designed for extreme lateral and vertical loads.
5. Heavy duty roller bearings, turned and ground shafts, press fits on gears, wheels, etc.
6. Standard heavy duty anti-friction bearing crane motors—oversize for severe service.
7. Control equipment built by the outstanding specialists in industrial control.
8. Special heavy duty crane wiring construction to insure safety and eliminate wiring troubles.
9. Unit bridge drive mechanism combined with heavy welded steel end trucks.
10. Hoist and bridge brakes designed for extreme loads and hard service.

NORTHERN ENGINEERING WORKS

General Office: **2613 Atwater St., DETROIT, MICH.**

NORTHERN CRANE & HOIST WORKS, Limited • WINDSOR, CANADA

Offices at—913 South 38th St., BIRMINGHAM • 53 West Jackson Blvd., CHICAGO • 2428 Spring Grove, CINCINNATI • 5724 Navigation Blvd., HOUSTON • 44 Whitehall St., NEW YORK • 555 Union Trust Bldg., PITTSBURGH • 4135 Gratiot Ave., ST. LOUIS • 1679 University Ave., ST. PAUL

Dear Editor:

CENSORED COPIES

Sir:

We are receiving copies of THE IRON AGE regularly. We find them of interest, but of most interest to us are the pages that have been cut out, for we wonder what they contained.

W. H. A. ROBERTSON,
Director
W. H. A. Robertson & Co., Ltd.,
Bedford, England

• So far the censors have allowed all 1943 copies to go out of the country unscathed.—Ed.

FARM TOOLS

Sir:

I read with great interest your article entitled, "Farm Tool Quotas Given Boost; Problem Long Neglected." This is one of the best summaries of this situation that I have seen.

I was particularly interested in your charts on page 92 (Mar. 11 issue). Could you give me the data on steel shipped to agriculture during 1940, 1941, 1942, and possibly earlier years?

D. H. MALCOM,
Manager
Agricultural Markets Dept.,
American Rolling Mill Co.,
Middletown, Ohio

• Steel supplied to the agricultural industry in the last three and in other representative years was (in net tons):

1942	1,167,000
1941	1,683,000
1940	1,630,000
1939	1,421,000
1938	1,109,000
1937	2,335,000
1932	604,000
1929	3,061,000
1926	2,020,000

—Ed.

AUSTENITE INDUCER

Sir:

In your Jan. 7 article on "Metallurgy at War," under heading of Nitrogen, you make the following statements:

"One of the late reports on nitrogen is that of Uhlig (ASM preprint No. 23, Oct., 1942) on the effect of this element in 18-8 stainless steels. He points out that very pure nitrogen-free 18-8 alloy, quenched from 2100 deg. F., is actually ferritic not austenitic at room temperature.

Nitrogen, which is accidentally present in the commercial 18-8 alloy, is found to inhibit the gamma-to-alpha phase change occurring on cooling to about 210 deg. F.

Alloys were prepared in pure alumina crucibles from nitrogen-free iron, chromium and nickel, melted in a vacuum. The resulting ferritic 18-8 analyzed 0.165 and 0.24 per cent N_2. The nitrogen content, with carbon at 0.007 per cent, proved, within the limits of X-Ray identification, to be sufficient to insure pure austenite phase."

In 1930 and 1931, the writer investigated 18-8 stainless steels with low carbon from the standpoint of gamma-to-alpha transformation. At that time it was determined that provided the carbon content is .01, or less, the 18-8 analysis will be decidedly magnetic, regardless whether it was quenched from high temperature, cooled from forging temperatures down to room temperature, or heated in the carbide embrittlement range. Therefore, the question is whether the alpha range exists because of the low carbon or presence of nitrogen.

The writer is of the opinion that the presence of nitrogen, if anything, will enhance the retention of austenite. It is a well-known fact that iron base alloys, such as nitralloy, high-speed steel, 18-8, etc. when subjected to nitriding treatment, although originally ferritic, will transform to austenite even at such low temperatures as 900 deg. F. This is a further indication to the writer that the nascent nitrogen facilitates formation of austenite, and if present in solid solution will inhibit the gamma-to-alpha transformation.

Although at present, we have no specific evidence of the behavior of hydrogen, indications are that this gas affects the structure in a similar manner that nitrogen does.

V. STEFANIDES,
Chief Metallurgist
Illinois Tool Works,
2501 N. Keeler Ave.,
Chicago, Ill.

BORON

Sir:

I should be grateful for six reprints of Mr. Lippert's article on "Boron," published in your issue of Nov. 19.

B. FULLMAN,
Information Officer
British Non-Ferrous Metals Research Assn.,
London, England

MACHINE SHOP TRAINING

Sir:

I would appreciate information on any publication which you may have available that would be suitable for machine shop practice training.

EMIL J. NOVAK,
Director of Training
Fairchild Aviation Corp.,
88-06 Van Wyck Blvd.,
Jamaica, N. Y.

• The best book we know of on machine shop training is "Machine Tool Primer," published by the Herbert D. Hall Foundation, 1060 Broad St., Newark, N. J., price $1.50.—Ed.

TOOL LIFE INCREASED

Sir:

Recently you sent me, upon my request, a copy of "How To Increase Cutting Tool Life." I would appreciate it if you would send me three more copies.

J. J. SPEAKMAN
Ferranti Electric, Ltd.,
Mt. Dennis, Toronto

Sir:

Please furnish me with a copy of "How To Increase Cutting Tool Life."

ARTHUR O. BEST,
Machinist
Navy Yard,
Anacostia, D. C.

• The articles on increasing cutting tool life have been reprinted in a new 52-page report entitled, "How To Make Cutting Tools Last Longer." The price is 35c. each, preferably in stamps.—Ed.

PLATING ON NON-METALS

Sir:

Could I get a copy of the article you published by Adolph Bregman entitled, "How To Plate Metals on Non-Metals," published in your issue of June 19, 1941? I am in dire need of the solution of plating on non-metal articles.

JOHN B. GARVEY
John B. Garvey,
Manufacturer of Crucifixes,
264 S. 16th St.,
Philadelphia, Pa.

GLASS GAGES

Sir:

Will you kindly let us know the date of publication of the article on Glass Gages by F. J. Oliver. This article relates to glass gages as developed by the Frankford Arsenal.

E. K. CARRINGTON,
Reference Bureau
American Automatic Electric Sales Co.,
1033 W. Van Buren St.,
Chicago, Ill.

• See pages 35 to 39 of the Feb. 4, 1943, Iron Age.—Ed.

HIGH-STRENGTH SOLDER

Sir:

We are using 50/50 tin lead solder on certain work for the Signal Corps and we find that the solder crystallizes and breaks down as a result of the vibration that it undergoes during normal functioning of the unit, and as a result we are compelled to use hard silver solder at a much higher temperature, with the result that the part to be soldered warps from the heat.

I would appreciate any information you may give me with respect to a substitute for 50/50 tin lead solder that will withstand vibration and also melt at not too high a temperature. The melting point should be about 700 deg. F.

Chief Methods Engineer
New Jersey

• We know of no solder that will melt at 700 deg. F. and have high strength and high fatigue resistance. The obvious solution to your problem is silver brazing. However, you say the part warps with silver solder. Therefore, you might try localizing the heat by using a small high frequency induction unit.—Ed.

THEY'RE Faster
AND GO FARTHER
American planes today have what it takes! Speed — wider cruising range — greater firepower — maneuverability! All this—due to the ingenuity of aviation engineers and machine tool builders — working with the right kind of tools. That's where Wesson Carbide Cutting Tools are doing their part — *cutting tougher metals, faster, with greater precision, with minimum rejects.* » » » Pioneers in "tooling up" for aviation motor production, Wesson Company is constantly setting new standards of precision and speed in Carbide Cutting Tools.
The counsel of Wesson engineers — skilled in engineering and designing of cutting tools — is available to help solve present war production problems, or for post war planning.
WESSON CO., DETROIT, MICH. (Ferndale Station)
WESSON
Carbide Cutting Tools
First choice when tough metals are to be cut — for special or standard purposes — for single or multiple setups.

WHEN THE WAR IS OVER we'll enjoy higher standards of living here in America. Automobiles, airplanes, tractors and trucks — household appliances — every machine and tool that's made of metal — will be better, safer, stronger.

Wesson Carbide Cutting Tools will help to make this possible by cutting *tougher* metals, with greater precision. And these things will cost less to buy — they'll operate more efficiently and more economically — they'll be safer and will last longer.

This Industrial Week . . .

- ***War Goods Programs Dip and Soar***
- ***Output of Steel Remains at 100***
- ***CMP Allotments Not All Gold Bonds***
- ***Balm for Sore Spots Being Brewed***

ONCE again the impossibility of attaining balanced production of military equipment or adhering to fixed war schedules is being demonstrated in the United States. As foreign campaigns unfold and strategy shifts, and as transportation problems vary, the changed requirements are reflected through wide sections of the metalworking industry.

A few months ago there seemed to be plenty of shell cases for U. S. fighting forces, but this week some authorities began to think that perhaps the shell case program might have to be pumped harder. A few months ago the Army tank program was being pushed aggressively but now the emphasis has eased. In other lines where peak production recently was implored and worker absenteeism flayed, curtailments and layoffs now are scheduled. Individuals and communities will suffer, temporarily at least.

At some distant date, the seeming lack of intelligence, the waste and expense of the war program and the lack of coordination undoubtedly will be criticized, yet in the heat of battle today most problems are understood.

Despite the contractions and expansions which have unsettled the arms-making picture, the production of raw metals continues undiminished, with demand far exceeding supply everywhere. Steel production remains at 100 per cent of capacity this week in spite of temporary dips and rises in certain individual districts.

THE steel picture is not entirely serene, however, for the problem of getting into the swing of the new Controlled Materials Plan has created confusion, so much so that some persons in Washington privately predict that phases of the plan will be postponed and the entire program will not come into full operation as quickly as expected. Consumers are complaining that they have not received allotments yet, or that allotments obtained are still blank checks, like the ratings granted so freely under the system being replaced.

Furthermore, allotments received by arms makers have been unbalanced, with the result that some manufacturing programs will be governed by the smallest percentages received. Critics say that this is an inevitable result of "marrying" three metals under a distribution system and that each should be handled separately.

Unfamiliar with the rules of CMP, some steel buyers have attempted to obtain in the first month their entire allotment for the second quarter. Much time is being spent correcting errors, resulting in loss of time. Vital information concerning the exact status of mills' schedules often is lacking at Washington.

CRITICISM also is heard against planning a basic material program on a quarterly basis, while the finished goods program, because of the nature of the war and its needs, can only be on an immediate-demand basis. Scheduling of critical components by WPB has run into grief because of the tight situations prevailing in certain kinds and sizes of materials. For instance, a program for bearings might be mapped out only to have it discovered that a critical jam exists in certain sizes of steel tubing needed for the bearings. Steps are being considered toward improving the scheduling of components through obtaining better information, lack of which is still apparent in many departments at Washington. Makers of common components have been told to file new forms for applications in third quarter, in which they will disclose the source of their orders.

Much thought at Washington is centering on possible ways to ease the tight situation prevailing in heavy steel bars. One aspect is the difficulty in obtaining raw steel for all bar mills. The semifinished steel has been going into other vital programs, like plate output which in March apparently came close to the goal of 1,170,000 tons that had been set. Plate production and distribution problems are much smoother than they were a few months ago and it is hoped in some quarters at Washington that the efficiency will not be lost in mid-Summer when the CMP is scheduled to take over the program. A coordinated division covering sheets, plates, strip and tin plate is cited by some experts as being a real need.

ANOTHER sore spot in the steel distribution picture needing WPB attention is said to be warehouse directives placed with steel mills. These directives simply order a mill to produce a given number of tons of a certain product for shipment to warehouses, but evenness of the flow to different warehouses has not been achieved.

After a lot of shouting and tumult the WPB has

News Highlights in This Issue

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removed restrictions on the production of various size concrete bars by billet mills. In a recent letter to steel companies, WPB rescinded the paragraph on production directives for concrete bars which restricted billet mills to ¼ in., 1⅛ in. and 1¼ in., those orders in which the engineering requirements call for billet steel and the provision that specific WPB orders for billet steel could be filled. In the April production directive, it will be unnecessary for billet mills to obtain specific approvals and they are free to accept orders on any sizes within the tonnage allowed by the directive. Re-rolling rail mills through WPB are obtaining more agriculture implement business.

A reduction in second-quarter tinplate requirements amounting to approximately 25,000 tons has been made, thus setting the new tentative figure at 650,900 tons. Can makers are appealing their second-quarter allotment which is said to have amounted to approximately 74 per cent of what they asked for.

AN announcement likely to play an important part in the continued renegotiation of excess profits on war contracts has been made. The four government departments have agreed that (1) stimulation of quantity production is of primary importance; (2) there shall be no fixed formula on profits; (3) profits will be figured on war business as a whole and not on any unit of that business; (4) as volume of business increases the margin of profit should decrease; (5) war profits should be compared with peace-time profits and war profits should not be as large as profits enjoyed on pre-war business; (6) the reasonableness of profits should be determined before taxes, and (7) a contractor may not expect excessive profits because he lacks adequate working capital. These principles are not in conformity with what private contractors say should be the guide, but it is believed they conform to the majority opinion in Congress and may serve to forestall any substantial change in the law.

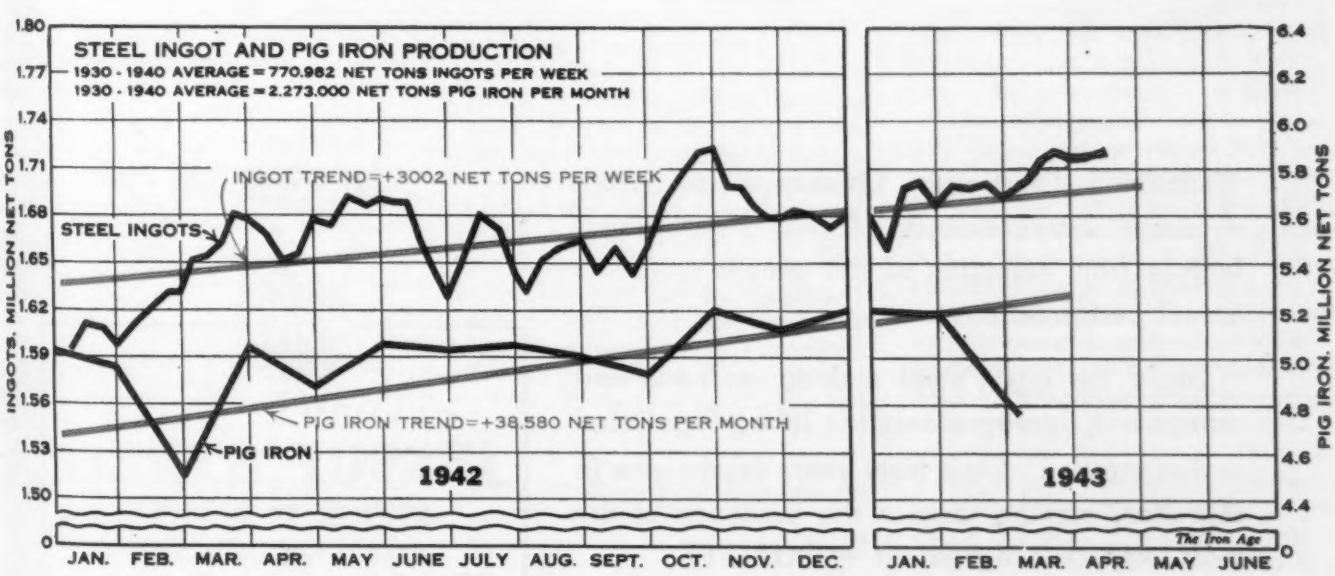
New Lines Need 280,000 Tons of Pipe

Washington

• • • Petroleum Administrator Harold L. Ickes announced last Saturday that WPB had given approval for the construction of a 1390-mile 20-in. petroleum pipe line from Texas to New York and an additional East Coast Terminus, not yet definitely determined. The line will require 280,000 tons of steel. Eighty-four electric motors will turn up a total of 105,000 hp. to drive the 84 pumps that will move the continuous column of petroleum from point of origin to destination. The cost of the line, to be financed by the government, is estimated at $75,000,000.

STEEL ingot production is off one point to 102 per cent in the large Pittsburgh district and Chicago, second steel producing area, is up one point to 100.5 per cent. Gains have been made in the Detroit district, up half a point to 107 per cent and in the South Ohio River area, up five points to 110 per cent. Steelmaking in and around Cleveland has decreased half a point to 99.5 per cent from last week's revised rate of 100 per cent while operations in the Eastern district have fallen three points to 103.5 per cent. Youngstown at 95.5 per cent continues at last week's rate, as do Philadelphia at 93, Buffalo at 104.5, Wheeling at 88, Southern at 102 and St. Louis at 106.5 per cent.

The Iron Age



Steel Ingot Production by Districts and Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	S. Ohio River	St. Louis	East	Aggregate
April 1	103.0	99.5	95.5*	93.0	100.0*	104.5	88.0	102.0	106.5	102.0	105.0	106.5	106.5	100.0
April 8	102.0	100.5	95.5	93.0	99.5	104.5	88.0	102.0	107.0	102.0	110.0	106.5	103.5	100.0

* Revised

JESSOP'S
Controlled Quality Plan

Means
BETTER STEEL

JESSOP'S Controlled Quality Plan covers every consideration of tool steel manufacture from selection of the proper grade to actual performance.

Using the latest steel making methods and equipment, **Jessop steels** are laboratory tested and controlled. Over forty years experience in fine steel making insures the presence of the most important ingredient — QUALITY.

★ ★ ★

HIGH SPEED • SPECIAL ALLOY • CARBON
COMPOSITE TOOL STEEL • STAINLESS
STAINLESS-CLAD

ESTABLISHED 1901

JESSOP STEEL COMPANY

HEAD OFFICE and WORKS
Washington, Penna.

WAREHOUSES
CHICAGO • CINCINNATI • DETROIT
CLEVELAND • HARTFORD

Continued Pressure During 1943 by OPA For Lower Net Steel Prices Predicted . . .

Pittsburgh

• • • **Steel executives** in this major center, not influenced too much by wishful thinking, see a stronger trend in 1943 toward contract renegotiation. At the same time, it is believed OPA will continue to exert pressure for lower net steel prices on certain items. The tip-off on the latter trend is found in the recent OPA induced reduction of steel casting prices by from 10 to 25 per cent.

To counter such moves, it is believed that steel companies would have to attempt to obtain some adjustments upwards on certain steel prices if the OPA carries out what is believed to be a move towards reducing the net price of such items as alloy specialty tubing and possibly other types of alloy steels, such as aircraft, etc.

Steel observers long have known that many steel products could only be sold at present prices because other more profitable items have borne more than their share of the load. Any successful attempt to whittle down the price on some of the products which are more or less specialized and which have gone from a relatively smaller production to a much larger volume, might be bound to have its effect on the ability to continue to sell some of the standard products such as plates, shapes, wire products, and bars at current quotations. The possibilities of adjustments on such items, however, would have to await a complete study of costs by the steel companies and finally the OPA.

There are some who are still confused on the current renegotiating of steel companies by the various Price Adjustment Boards. It is true that the PAB has been renegotiating only on those cases where the material has been for the government or one of the governmental agencies. This does not mean, however, that the PAB is restricting itself to the prime contractor. Steel companies which are furnishing steel for war items made by either a first, second, or third contractor are vulnerable too and are being renegotiated, so long as the end use can be traced to war products.

. . . Recently OPA cut steel casting prices 10 to 25 per cent . . . Steel company contracts are being renegotiated . . . Rumblings are heard that some upward adjustments should be made if certain price reductions materialize . . . This story indicates what is in store for the metalworking and steel industry.

However, in the case of the average steel company, the final completion of the renegotiation deal will no doubt result in the return to the government of a lump sum of money, the amount of which is arrived at by renegotiation conferences. The steel companies as a rule will not be required by PAB to reduce their base prices of steel, since this would upset the entire steel basing point selling system.

On the other hand, the base steel prices, as well as extras, are controlled by OPA. In the case of a prime contractor, who was producing, for instance, machine guns, the PAB, as part of the renegotiation, not only might require a return of money to the government, but at the same time would stipulate that the company reduce its price to the government for future deliveries of the particular item under question.

While at one time there might have been conflict between the orbits of the PAB and the OPA, this situation was "straightened out" late last year and each organization is handling the over-all price situation so that overlapping has been eliminated as far as possible. As far as the steel industry is concerned, PAB is interested and usually starts its investigation on the basis of *operating income*, especially as it relates to total sales income. While net income is scrutinized both by PAB and OPA, both organizations base their studies on income before taxes.

Operations of the PAB (whether it be Army, Navy, Lend-lease, or Maritime) are predicated on the study of and the renegotiation of a specific company, although there are cases where companies might be taken as a group. One important factor not generally known or understood is the attention given by the various PAB's to what is known as "intangible credits."

Steel companies (or any company for that matter) under renegotiation which can show that they have voluntarily reduced prices, carried on an excellent performance, pooled their patents, converted their plants with their own money, sub-contracted liberally to speed production, cooperated with contractors, assumed risks which they might not otherwise take in peace times, and suffered handicaps in material deliveries, might find themselves in a much better position than companies which have not done any one or several of these things.

The OPA, in its attempt to beat down extras, and perhaps base prices, on specialized steels which have enjoyed a much greater volume because of the war, has a much more complicated problem on its hands. There is such a thing as "killing the goose that lays the golden egg," althought probably it is true that the stamina of this goose is probably much greater than is generally supposed.

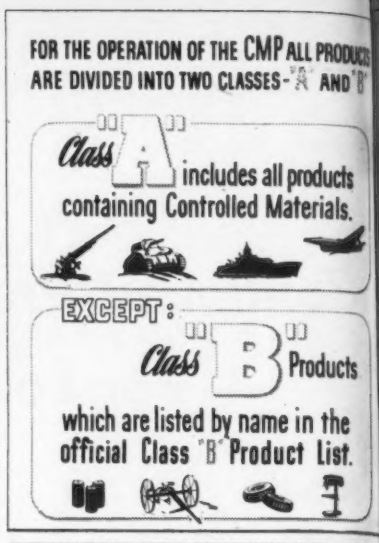
The pressure points from the OPA definitely will be directed towards those special steels which so far, in the past year, have become a much greater proportion of the total steels produced, and the finger points at the alloy situation.

NEW CHALK TALK on Controlled Materials Plan

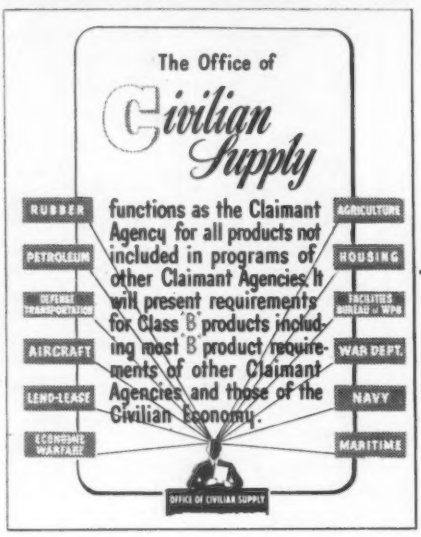
. . . On these two pages, reading straight across, are excerpts from a new visual presentation prepared by the government, consisting of about 50 colored posters.

(*For more CMP news turn to pages* 118, 119, 140, 141).

NEWS OF INDUSTRY


FOR THE OPERATION OF THE CMP ALL PRODUCTS ARE DIVIDED INTO TWO CLASSES - "A" AND "B"
Class "A" includes all products containing Controlled Materials.
EXCEPT:
Class "B" Products
which are listed by name in the official Class "B" Product List.

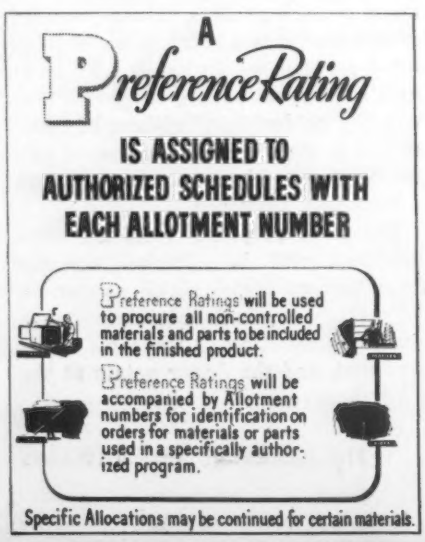
STEP NO. 1
Total Tonnage REQUIREMENTS ARE DETERMINED
A BILL OF MATERIALS or other equivalent information is required as a basis for estimating requirements. Such information, however, is prepared by the manufacturer
ONLY UPON RECEIPT OF A REQUEST FROM HIS CUSTOMER


The Office of
Civilian Supply
functions as the Claimant Agency for all products not included in programs of other Claimant Agencies. It will present requirements for Class "B" products including most "B" product requirements of other Claimant Agencies and those of the Civilian Economy.
RUBBER
PETROLEUM
AIRCRAFT
LEND-LEASE
AGRICULTURE
HOUSING
WAR DEPT.
NAVY
MARITIME
OFFICE OF CIVILIAN SUPPLY

The Office of
Civilian Supply is responsible for compilation of Bills of Materials or of any other approved basis of determining requirements of Controlled Materials for most Class "B" products and will obtain such information through Industry Divisions.
WPB Industry Divisions
obtain Bills of Materials (or other information or requirements) for Class "B" products in the same manner and through the same channels as Claimant Agencies obtain Completed Bills of Materials for Class "A" products.

STEP NO. 5
REQUIREMENTS COMMITTEE MAKES Final Allotments of STEEL, COPPER and ALUMINUM TO THE CLAIMANT AGENCIES
These allotments are for all purposes, including Construction and Facilities, and Operating Supplies and are given Quarterly by Months to each Claimant Agency
CLAIMANT AGENCIES

STEP NO. 6
Controlled Materials ARE ALLOTTED TO PRIME AND SECONDARY CONSUMERS
CLAIMANT AGENCIES
Before making allotments to prime and Secondary Consumers....
CLAIMANT AGENCIES
readjust their Schedules to fit their allotments.
Claimant Agencies and Industry Divisions then advise their
PRIME CONSUMERS
of their allotments and authorized production schedules.


A Preference Rating
IS ASSIGNED TO AUTHORIZED SCHEDULES WITH EACH ALLOTMENT NUMBER
Preference Ratings will be used to procure all non-controlled materials and parts to be included in the finished product.
Preference Ratings will be accompanied by Allotment numbers for identification on orders for materials or parts used in a specifically authorized program.
Specific Allocations may be continued for certain materials.

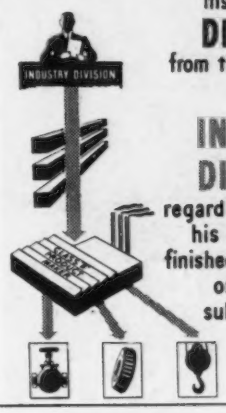
STEP NO. 7
THE Controlled Materials Divisions
ISSUE PRODUCTION DIRECTIVES TO THE CONTROLLED MATERIALS PRODUCERS
within their capacity to produce.
CONTROLLED MATERIALS DIVISIONS may issue production Directives to produce specific tonnage per month of certain shapes, forms and sizes.
DIRECTIVES are based upon information provided by Claimant Agencies or through the Divisions records of over-all requirements, capacities, order load on Producers, etc.
WAREHOUSE STOCKS are maintained by Directives issued by the Controlled Materials Divisions.

STEP NO. 8
PRIME CONSUMERS and SECONDARY CONSUMERS order CONTROLLED MATERIALS
AND MATERIALS OTHER THAN STEEL, COPPER AND ALUMINUM.

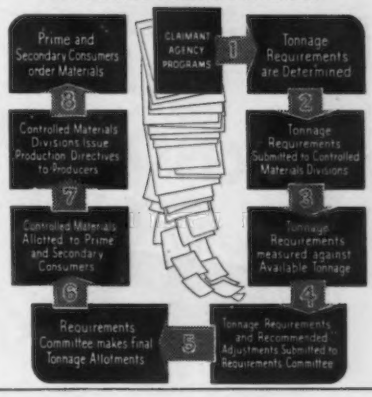
The Maker of a CLASS "A" *Product* receives his allotment of Controlled Materials from the appropriate CLAIMANT AGENCY if he is a PRIME CONSUMER

If his product is a Class "A" part or sub-assembly, he receives his allotment from his CUSTOMER

Generally the maker of a CLASS "B" *Product* obtains his allotment DIRECTLY from the appropriate WPB INDUSTRY DIVISION regardless of whether his product is a finished (end) product or a part or sub-assembly.



Now let's consider the 8 *Major Steps* in the detailed OPERATION of the CMP


Prime and Secondary Consumers order Materials
CLAIMANT AGENCY PROGRAMS
1 Tonnage Requirements are Determined
2 Tonnage Requirements submitted to Controlled Materials Divisions
3 Tonnage Requirements measured against Available Tonnage
4 Tonnage Requirements and Recommended Adjustments Submitted to Requirements Committee
5 Requirements Committee makes final Tonnage Allotments
6 Controlled Materials Allotted to Prime and Secondary Consumers
7 Controlled Materials Divisions Issue Production Directives to Producers
8

For INDUSTRIAL MAINTENANCE, REPAIR, AND OPERATING SUPPLIES

CLAIMANT AGENCIES responsible for estimating Total Tonnage Requirements for the plants or establishments they own and operate.

OFFICE OF CIVILIAN SUPPLY is responsible for estimating ALL OTHER Tonnage Requirements through ....

INDUSTRY DIVISIONS which will obtain Tonnage information from Prime and Secondary Consumers.

STEP NO. 2

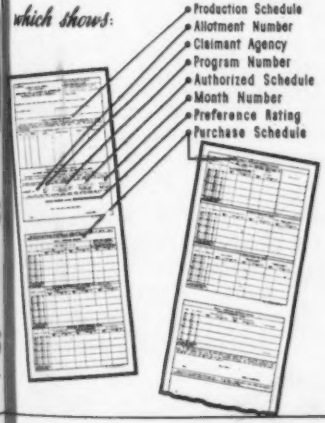
Total Tonnage REQUIREMENTS for all products and programs are submitted by each Claimant Agency to CONTROLLED MATERIALS DIVISIONS with copies to the Requirements Committee.

STEP NO. 3

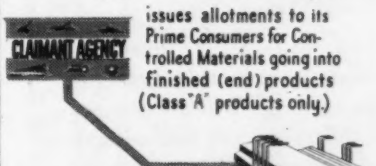
Tonnage Requirements are measured against AVAILABLE TONNAGE and, if necessary, preliminary adjustments are prepared by the Controlled Materials Divisions and the Office of the WPB Program Vice Chairman.

Allotments are issued by using this form which shows:

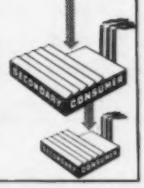
- Production Schedule
- Allotment Number
- Claimant Agency
- Program Number
- Authorized Schedule
- Month Number
- Preference Rating
- Purchase Schedule



EACH *Claimant Agency* issues allotments to its Prime Consumers for Controlled Materials going into finished (end) products (Class "A" products only.)



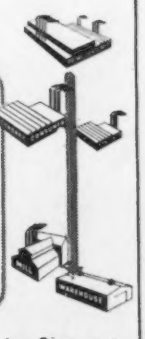
THE *Prime Consumer* Then divides his allotment of Controlled Materials into amounts for his requirements and the requirements for the parts and sub-assemblies he buys. He then issues allotments to his Secondary Consumers (and Secondaries to their Secondaries.)



OFFICE OF *Civilian Supply* divides its Controlled Materials allotment for Class "B" finished (end) products among the appropriate WPB *Industry Divisions* which issue Allotments to manufacturers.

In Special Cases other Claimant Agencies may make allotments for particular Class B products.

Upon receipt of *Allotment* CONSUMERS PLACE ORDERS FOR CONTROLLED MATERIALS WITH THEIR SUPPLIERS

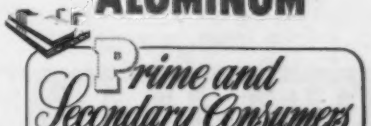


Purchase orders covering Controlled Materials, Materials other than Steel, Copper and Aluminum or parts may be placed for a long term contract. But no part of a Purchase Order shall be deemed an "Authorized Order" until the Allotment Number for that part of the order has been "released", specifying deliveries.

HOW *Combined Orders* MAY BE ISSUED BY A CONTROLLED MATERIALS CONSUMER

A consumer of Controlled Materials who receives numerous Purchase Orders bearing Allotment Numbers, authorizing the purchase of small quantities of Controlled Materials, may combine such small allotments into one Purchase Order to the Material Supplier. Such combined orders are subject to detailed regulations.

For MATERIALS OTHER THAN STEEL COPPER *and* ALUMINUM *Prime and Secondary Consumers* must not use Preference Ratings to procure materials or parts in greater quantities or at a more rapid rate than their (end) product schedules require.



NEWS OF INDUSTRY

OAKITE "KNOW-HOW" AT WORK!

MAKING BETTER STAINLESS STEEL PARTS FASTER!

...airplane exhaust manifolds, for example

Stainless steel aircraft exhaust manifolds are light, strong and extremely corrosion-resistant. Mass producing them, however, requires specialized techniques not found when working with ordinary steels. Even before the present extensive use of stainless steel in aircraft and ordnance, Oakite "know-how" had the answer to many difficult production problems. Here are two of the more common:

Drawing & Stamping

Wear of dies in drawing and stamping stainless steel is rapid. Greater pressures are required. Consequently, higher temperatures result. Lubricants must, therefore, stand up under critical conditions. Oakite Drawing and Stamping Compounds meet these requirements and, very important, are easy to remove in alkaline degreasing solutions.

Degreasing & Descaling

Prior to annealing, drawn parts should be completely grease-free, lest splitting and surface carburization occur. Oakite degreasing materials thoroughly remove heavy, tenacious drawing compounds . . . rinse freely . . . are safe to use. Annealing scale, too, may be dissolved by immersing parts in Oakite pickling solutions.

COMPETENT TECHNICAL HELP FOR THE ASKING!

If you now have a problem that requires on-the-spot, technical assistance, write, wire or 'phone for the Oakite Technical Service Representative in your locality TODAY! He can extend intelligent, competent help. For factual data, based on a close, in-the-plant study of stainless steel production operations, write for NEW Special Service Report. No obligation, of course.

OAKITE PRODUCTS, INC., 30H Thames Street, NEW YORK, N. Y.

Technical Service Representatives in All Principal Cities of the United States and Canada

OAKITE MATERIALS...METHODS...SERVICE — Buy Bonds for Victory — CLEANING FOR EVERY CLEANING REQUIREMENT

Deferees Escape Scorn Under Plant Committee Method

• • • **Who is to decide** which employees should be considered "irreplaceable," and which should not? Job by job, name by name, which employees should a company seek to have deferred, and how should these claims be presented to draft boards?

To handle this situation, the Lycoming division of the Aviation Corp. established a plant occupational deferment committee. It functions with two permanent members, the plant superintendent and a full-time selective service adviser; the divisional superintendent and departmental foreman of the employee whose case is being considered sitting in as committee members for that particular case.

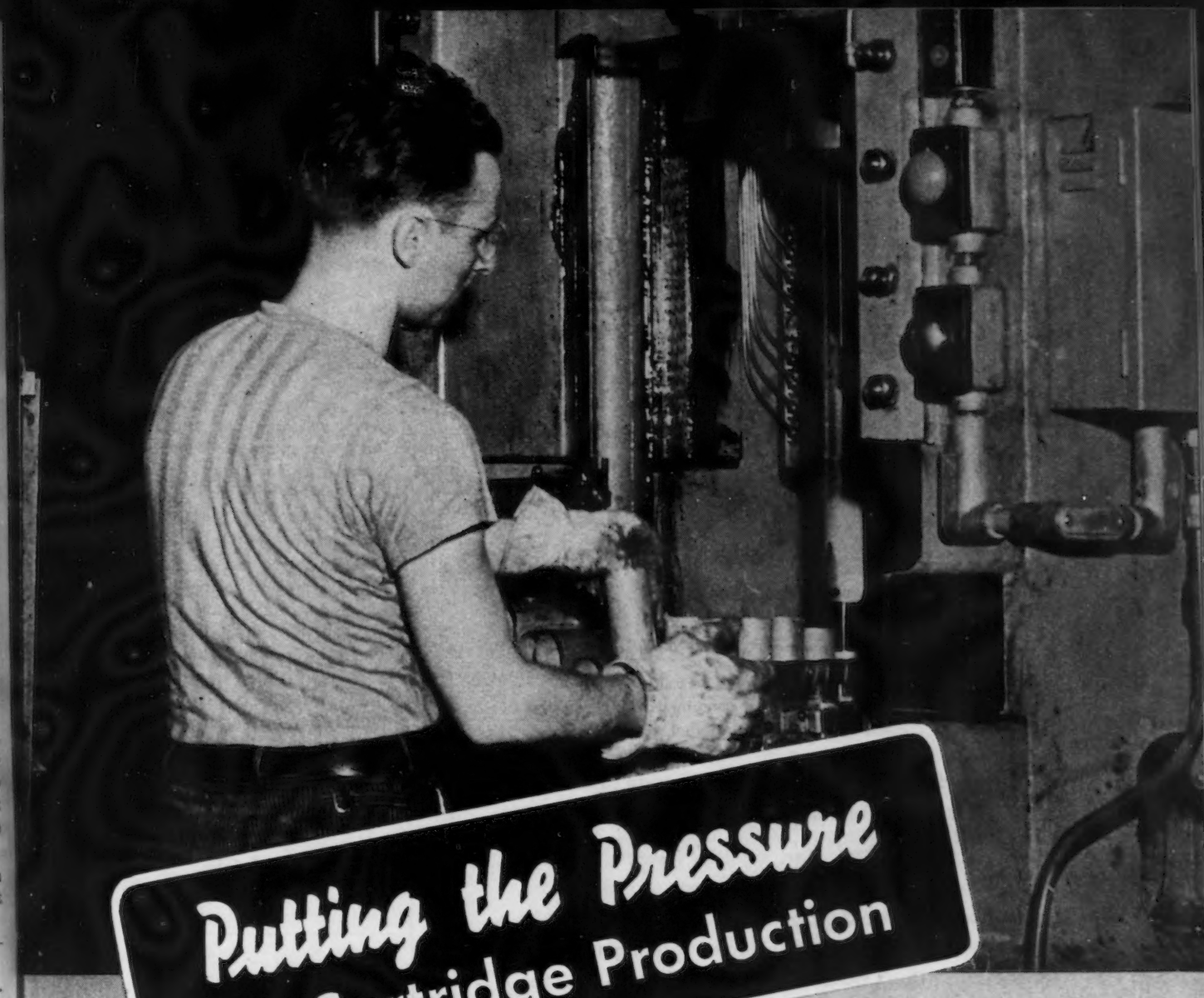
Employees receiving draft questionnaires report to the selective service adviser, C. W. Shaffer. It is his job to know, as soon as possible, just where every employee stands in the draft.

As cases come up for consideration by the plant occupational deferment

---

CEILING UNLIMITED: An interested spectator at the initial test of the new Boeing Stratotrainer was Dr. Sanford Moss, well-known engineer and inventor of the turbosupercharger. The Stratotrainer, designed by Boeing Aircraft Co. engineers, makes possible at one time the training of crews for high altitudes.

British-Combine



Putting the Pressure on Cartridge Production

SOLNUS HYDRAULIC OILS

On the job 8760 hours . . . Still good for many more!

If you are running your hydraulically operated equipment on a "round-the-clock schedule" here are facts on hydraulic oils you should consider.

In a large cartridge-making plant three lines of hydraulic presses were drawing the brass cases from cups to finished size on a 24-hour a day schedule. In each of these presses a different oil was used—Solnus Hydraulic Oil, a competitive oil of equal price and another costing considerably more.

After all three had been in continuous operation for 8760 hours at pressures up to 2500 pounds per square inch samples were taken of each and tested for all the essential characteristics. The results? Solnus Hydraulic Oils were in practically new condition ready for many more hours of extra service, while the other oils showed a deterioration to such a degree that they were ready to be changed.

This is only one of the many instances in which Solnus Hydraulic Oils have demonstrated their long life and ability to stand up under pressure. If you want to improve the operation of your hydraulic system call in a Sun specialist—one of those Doctors of Industry. He's ready, willing, and able to help you keep your production on a round-the-clock schedule. Write . . .

SUN OIL COMPANY, *Philadelphia*

Sun Oil Company, Limited, Toronto, Canada

SUNOCO

SUN PETROLEUM PRODUCTS HELPING INDUSTRY HELP AMERICA

WHAT OF WIRE TODAY?

Yes! WHAT OF WIRE?

There is little prospect for improvement in delivery or allocation conditions. *Be Scotch as you handle wire you must have.*

FOR SHAPED WIRES it is good sense to use only standard analyses and shapes.

FOR WELDING WIRE, start right by insisting on getting wire of correct analyses, of proper characteristics for the kind of welding you are doing and of the diameter for greatest efficiency—leaning toward larger sizes. Don't permit bending of electrodes. See that there is no wasteful, excess deposit in the weld. Insist that each electrode is used down to the holder.

FOR GENERAL WIRE, eliminate "specials" from specifications if you have not already done so and, again, see that there is no waste.

If we can help, call on us—remembering that the wire needs of the armed forces and those working directly for the war effort have first call, as you would have it.

PAGE FOR WIRE

PAGE STEEL & WIRE DIVISION

Monessen, Pa., Atlanta, Chicago, New York, Pittsburgh, San Francisco

In Business for Your Safety

AMERICAN CHAIN & CABLE COMPANY, Inc.
BRIDGEPORT • CONNECTICUT

committee, he classifies them by departments and notifies the various division superintendents and foremen as to when their respective employees' cases are to be reviewed by the committee. The committee decides, case by case, as to whether the company will or will not seek deferment.

This method of operation has the approval of the state selective service system and the man-power commission. It gives the draft board the assurance that a request for deferment is made not on the basis of guesswork or wishful thinking, but after careful deliberation and with full consideration of the facts.

The selective service adviser, Mr. Shaffer, is of aid to the draft board because he sees to it that occupational deferment claims are presented properly and in time. In this connection, Mr. Shaffer says, it has proved helpful to install a deferment expiration date file, so that each case can be reviewed by the committee, and its decision can be forwarded to the draft board before the deferment expires. The draft board in turn notifies the company of its decisions as soon as possible.

As war needs for manpower became more urgent, further measures were necessary because there seemed to be

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AERO-WELDING: High temperature atomic-hydrogen arc welding is speeding the fabrication of high altitude airplane equipment, according to the General Electric Co. Among principal items are oxygen containers, hollow propeller blades, and superchargers.

WHEN THE PROBLEM CALLS FOR SPECIAL EQUIPMENT

Yanks Would Give Thanks for This!

MEDART has made it...or Medart can make it!

SOME OF THE SPECIAL MACHINES BY MEDART DURING THE PAST YEAR

★ *An automatic machine for straightening rifle barrels.*
★ *A mechanism for driving a portable 1000 H. P. Generator with ten 100 H. P. diesel engines.*
★ *A machine for de-rodding metal tubing.*
★ *A billet cold centering machine for tube mills.*
★ *A 400 H. P. Gear reduction unit for a stern wheel towboat.*
★ *Mechanical driving units for agitator tanks.*
★ *Automatic bar feeding table.*
★ *Automatic bar delivery and storage tables.*
★ *Bar cradles.*
★ *Chain wheels.*
★ *Furnace car bearings.*
★ *Furnace door frames, etc.*

Much as Medart engineers would like to ease the K. P.'s lot with the ingenious machine above, Medart concentrates, today, on the problems of American industry...the engineering and manufacturing of complete power transmission equipment and on the manufacture of special equipment for specialized jobs.

Over 1,000,000 pattern combinations are in Medart files. The solution to your own special equipment problem is very likely right on hand!... And that special machine you need may be made quicker than you think.

Manufacturing Engineers of Complete Transmission Equipment and Specialized Machinery

MEDART

THE MEDART COMPANY
3500 DE KALB ST., ST. LOUIS, MO.

PREVENT ACCIDENTS

IT'S NON-SKID!
IT'S FIREPROOF!
IT'S USED DRY!
•
QUICKLY CLEANS
GREASE CAKED FLOORS
•
NO CAUSTICS OR ACIDS-
HARMLESS TO HANDS,
FEET, CLOTHING!

Carey

GREASE BALL

ASBESTOS SWEEPING COMPOUND

At last a sweeping compound that quickly cuts away and removes gummy grease and oil deposits, thereby eliminating fire hazards and the cause of accidents due to slippery floors. Also neutralizes and soaks up acids around pickling vats, storage battery spillage, cleaning solutions, etc.

LESSENS FIRE DANGER

It's FIRE-SAFE. Classified as Non-Combustible by Underwriters' Laboratories, Inc. It is used DRY; nothing to add; floors remain dry. Easy to use. A good stiff brush is all equipment needed. Absorptive action; mildly abrasive. Inexpensive. May be used over and over until fully soaked.

Carey Grease Ball contains no acids or caustics. Does not harm hands, clothing or floors. No critical materials. Prompt shipment in convenient 50-lb. bags from 45 branch warehouses. Write for FREE sample and full information. Address Dept. 26.

10-POUND SAMPLE
brings
1000-LB. ORDER

A prominent metals fabricator had serious floor condition due to drippings from steel sheets after oil treatment.
When the gummy, slippery mass of accumulated oil could not be removed by ordinary compounds, Carey Grease Ball was put to the test. Results were so satisfactory that a 1000-lb. order resulted.

THE PHILIP CAREY
MANUFACTURING COMPANY

Dependable Products Since 1873

LOCKLAND, CINCINNATI, OHIO

In Canada: The Philip Carey Co., Ltd.
Office and Factory: Lennoxville, P. Q.

no method of governing the number of employees called each month. This made forward planning difficult in the extreme.

The result was the Manning Table and Replacement Schedule plan, now in process of quite general adoption throughout industry. Under this plan the employer's manpower requirements are listed, replacements are scheduled, insofar as possible, and men are drafted on an orderly basis agreed upon between the employer and the draft board.

In the case of Lycoming this method has proved helpful indeed. But a major reason is the previous experience with this whole problem obtained through the functioning of the plant occupational deferment committee.

There is still another angle to this situation that must be carefully borne in mind—and that is the personal emotions of the individual employee.

"Some of the boys in our plant did not know whether, as young Americans anxious to win the war, they should stay in the plant or join the Army," says Mr. Shaffer.

"I recall one boy in particular—let's call him 'Tommy.' He's a fine youngster. He worked from 3 p.m. to 11 p.m. six and seven days a week. His job was to finish precision aircraft engine parts, and he did it well. He knew how badly they were needed.

"But down at the depot, when a group of inductees boarded the train, some remarks were passed that were not so pleasant. Somebody said that Tommy was 'yellow.' He had been deferred, by his draft board, at our request, for a period of eight months.

"That was early in the game. He's in the Army now.

"Today the men who are deferred, because we ask it, don't have to worry about 'what the neighbors think.' Why? Because everybody knows that this committee works with the draft board. Because everybody knows that when a man is deferred, there must be a good reason for it.

"To sum up—there are four major results obtained from the functioning of a Plant Occupational Deferment Committee:

"1. The draft board is assured of the company's cooperation in helping to furnish the necessary men to the army.

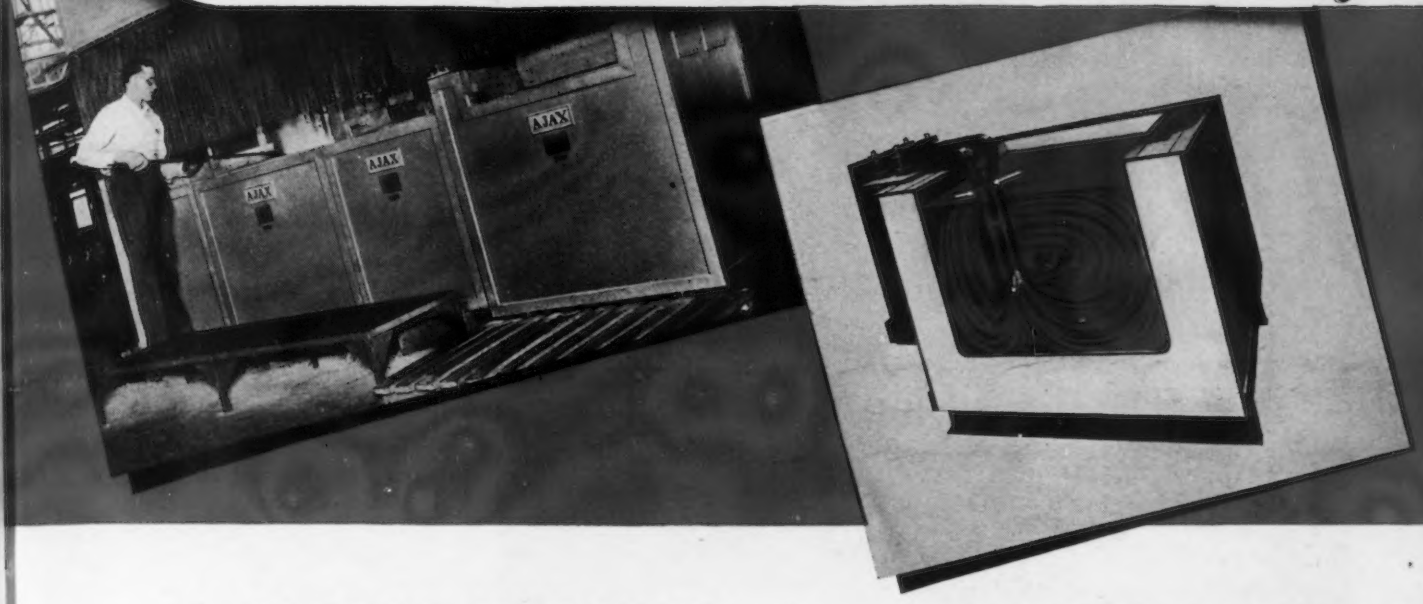
"2. The company is assured of the draft board's cooperation in deferring men in vital positions.

"3. The company has a definite plan and method of handling its manpower and replacement problems.

"4. Plant morale is improved because employees know that deferment decisions, one way or the other, are the result of careful consideration upon the part of both the company and the draft board.

"Such, at least, has been our experience. And I might add that production totals at Lycoming today indicate no lack of manpower."

Certain things come FIRST ★ ★ ★ in Heat Treating!



. . . A RECORD WITHOUT PARALLEL IN THE HEAT TREATING FIELD!

American industry has invested millions of dollars in Ajax-Hultgren electric salt bath furnaces. And based upon the unique Ajax electrode heating-and-circulating principle, the following facts bear relation to your present and future requirements:

Ajax was first to *mechanize* salt baths . . . First to use *ceramic pots* for neutral hardening . . . First to use welded boiler plate furnace pots for *carburizing* . . . First to develop salt bath furnaces for *deep-case carburizing* (up to .125"), . . . First to harden *high speed steel tools* successfully . . . First to discover and apply salt baths for *brazing* and for *simultaneous brazing* and *carburizing* . . .

All heat is generated within the bath, using the liquid salt itself as a resistor between the closely-spaced electrodes. Electromotive forces at the electrodes produce a vigorous circulation throughout the bath, as indicated by the arrows. Only the Ajax furnace possesses this electromotive circulation—the flow that inhibits temperature differences anywhere in the bath.

The largest salt baths for heat treating aluminum alloys were installed by Ajax . . . Ajax was first to develop salt bath *heating for forging*—and likewise first to develop the only salt baths used for hardening *armor-piercing shot* and a host of armament applications still on the list of wartime secrets.

Certain things come first in heat treating: Low cost, overall efficiency, maximum output—highest quality of end product with the simplest means. Perhaps that is why the connected load of over a thousand Ajax furnaces since 1936 totals more than 100,000 KW today.* Write for Bulletin 107-A.

AJAX ELECTRIC COMPANY, Inc., Frankford Ave. at Delaware Ave., Philadelphia, Pa.

*THERE'S AN AJAX INSTALLATION NEAR YOU!

THE AJAX HULTGREN ELECTRIC SALT BATH FURNACE

ASSOCIATE COMPANIES:

AJAX METAL COMPANY, *Non-Ferrous Ingot Metals and Alloys for Foundry Use*
AJAX ELECTROTHERMIC CORPORATION, *Ajax-Northrup High Frequency Induction Furnaces*
AJAX ELECTRIC FURNACE CORPORATION, *Ajax-Wyatt Induction Furnaces for Melting*
AJAX ENGINEERING CORPORATION, *Ajax-Tama-Wyatt Aluminum Melting Induction Furnaces*

THIS IS WHAT HAPPENS WHEN
SWEATING ROBS THE BODY OF SALT
-5% LASSITUDE
-10% LOSS OF WILL TO WORK*
-20% EFFORT FORCED*
-30% DIZZINESS*
-40% HEAT CRAMPS
-50% PROSTRATION
*HEAT-FAG
THAT IS WHY AMERICA'S LEADING MANUFACTURERS FURNISH SALT TABLETS TO WORKERS

When men sweat, one of the most essential body minerals — salt — is dissipated. Vitality is sapped. Lassitude sets in. Heat-Fag follows and even cramps or prostration result if salt lost through sweating is not replaced.

Beware of Heat-Fag. It is a dangerous, insidious force that brings on fatigue — renders men inalert—slows down reactions. Often it is the direct cause of industrial accidents. As salt is sweated out, the worker tires, becomes careless — a slight miscalculation — and another costly accident is chalked up. Heat-Fag has again taken its toll.

Production-minded men know that Salt Tablets are a "must" for workers who sweat and do hot work. That's why they are always available in leading industrial plants...why they are recognized as the simple, easy and sanitary way to replace the body salt sweated out.

MORTON'S Heat-Fag SALT TABLETS

QUICK DISSOLVING
(Less than 30 seconds)
This is how a Morton Salt Tablet looks when magnified. See how soft and porous it is inside. When swallowed with a drink of water, it dissolves in less than 30 seconds

Case of 9000, 10-grain Salt Tablets, $2.60
Salt-Dextrose Tablets case of 9000, $3.15

Place **MORTON'S DISPENSERS** at all Drinking Fountains.
They deliver salt tablets, one at a time, quickly, cleanly — no waste. Sanitary, easily filled, durable.
500 Tablet size - $3.25
1000 Tablet size - $4.00

Order from your distributor or directly from this advertisement.

MORTON SALT COMPANY • CHICAGO, ILLINOIS

Ore Boats Battle with Ice on Lake Superior

Cleveland

• • • **According to reports** from the upper Lake regions, there is more ice on Lake Superior this Spring than at any time in the past 10 years, and much of it was formed during the first two weeks of March when there were 14 days of sub-zero temperature. Coast Guard boats have been attempting to determine how quickly ice breakers can be brought to bear on the upper Lake ice, but even with favorable conditions for the ice breakers in opening Lake navigation, it is expected that the first up-Lake bound boats will be unable to pass the Soo locks before April 15. Last year, the first boat locked through on the up-Lake trip on March 23, and on the same day the first cargo of ore was loaded at Escanaba, Mich.

Two ore boats of the Inland Steel Co. fleet were loaded with 25,000 tons of ore early this week at Escanaba, and at press time were battling their way through 7½ miles of ice out of the Escanaba harbor, preceded by a large tug that is breaking the densely packed ice. The boats, the L. E. Block and the P. D. Block, are expected to clear the ice in time to make the Indiana Harbor docks in lower Lake Michigan late this week. If the two Inland boats are successful in getting through the ice this week, they will be the first boats to move ore cargos this year.

COMING EVENTS

April 8 to 9—SAE National Aeronautic Meeting, New York.

April 8 to 10—Electrochemical Society, Pittsburgh.

April 12 to 16—American Chemical Society, Detroit.

April 28 to 30—American Foundrymen's Association, St. Louis.

April 29 to 30—American Institute of Mining and Metallurgical Engineers, Cleveland.

May 10 to 12—Mill Supply Convention, Cincinnati.

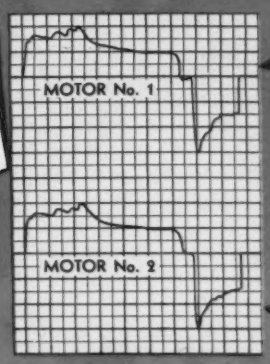
May 17 to 18—National Association of Sheet Metal Distributors, Cleveland.

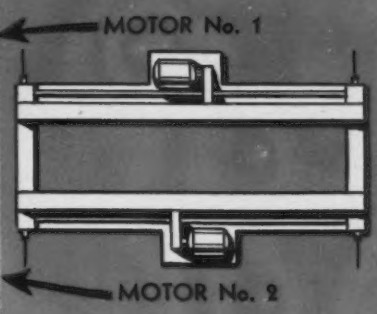
May 17 to 19—American Gear Manufacturers Association, Rye, N. Y.

June 9 to 10—SAE War Materiel meeting, Detroit.

2 MOTORS operate as one with this EC&M DUPLEX Controller and SINGLE MASTER

96-ft. Span O.H. Stockyard Cranes





Graphic ammeter curves taken simultaneously of the 2-40 h.p. series motors on the bridge motion of these cranes are practically identical, showing that each motor takes its share of the load under any operating condition.

ON many crane and mill drives, it is common practice to employ two or more motors of the same horsepower rating which are mechanically connected through the gearing to drive the same load.

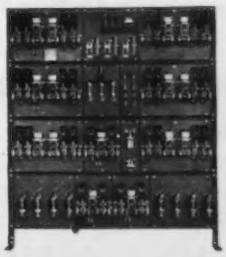
Although this dual method of motor drive offers many advantages, the control must be designed correctly to insure that the motors divide the load equally or severe strains on machinery or damage to the motors will occur.

EC&M *Duplex* Magnetic Control (with double-pole contactors) not only provides an independent circuit for each motor, but also insures equal division of the load by maintaining uniform values of current in each motor circuit under *any* condition—starting—accelerating—stopping or reversing.

Likewise, when bringing the master switch to the "off" position or when an overload relay trips, the brakes on each motor (as used on duplex hoists, etc.) are applied simultaneously, thus eliminating severe strains on the gearing, shafts, and bearing bolts that mechanically connect the motors.

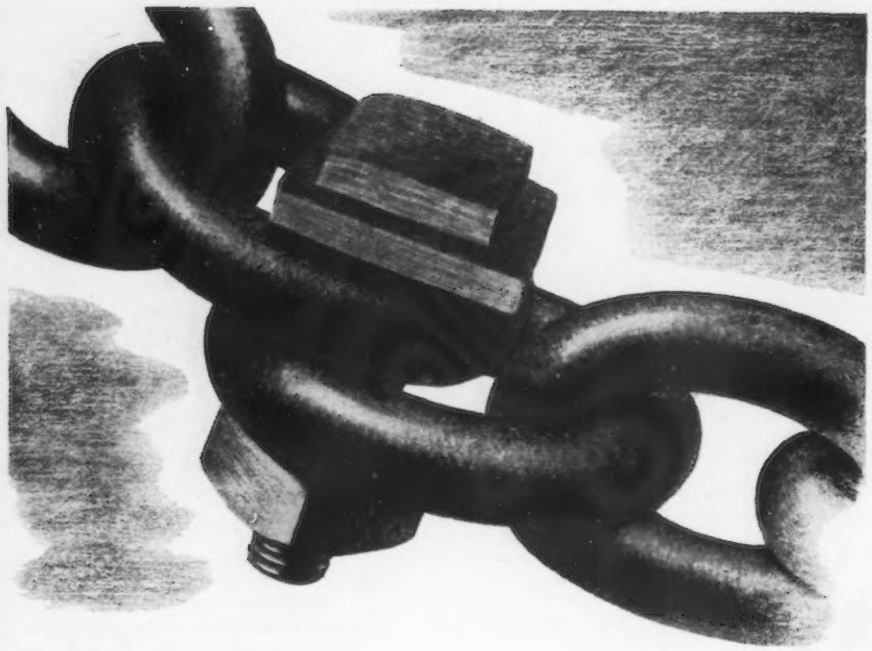
For applications where four motors are operated in parallel and connected through the gearing to drive the same load, the EC&M *Quadruplex* Magnetic Controller (with 4-pole contactors) is available. Complete details on request.

EC&M Duplex Controller for D-c Motors, Bulletin 921 for cranes—Bulletin 925 for mill auxiliaries.



Also built for A-c wound-rotor motor drives in both duplex and quadruplex style—Bulletin 930.

THE ELECTRIC CONTROLLER & MFG. CO.
CLEVELAND OHIO



DON'T DO THIS!

...it isn't safe!

When somebody neglects to repair a broken chain and somebody else in a hurry splices the two ends with a bolt . . . *TROUBLE'S HEADED YOUR WAY!* It's easy to learn the right way to handle chain. We'll gladly send you suggestions on request. Teach your new workers the right ways before they have a chance to learn the wrong ways, of which there's quite an assortment.

The highest possible preference rating should be obtained and shown on orders placed for chain

AMERICAN CHAIN DIVISION

York, Pa., Boston, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco

AMERICAN CHAIN & CABLE COMPANY, Inc.

BRIDGEPORT • CONNECTICUT

In Business for Your Safety

New Approach Used in Study of Absenteeism

Pittsburgh

• • • **A more reasonable** approach to the absentee worker problem is being taken by management, government and the unions. Tackling one phase not generally covered and which involves the study of sickness cases and non-industrial injuries continuing for eight consecutive days or more, the Industrial Hygiene Foundation finds that 40 per cent of these cases are due to respiratory diseases, any of which may have had their beginning with the common cold. The conclusion can be drawn that many workers who fail to take one or two days off in the early stages of the cold, thus possibly recovering or preventing secondary effects, undoubtedly turn up later as full-fledged sickness cases which require much more time than a few days to recover.

The Foundation also has found that the reactions of the workman to his company, his boss, or to the work carry just as much weight in the absentee picture as other factors. It is probable that as the work week increases, the differences of opinion between medical authorities and operational department heads will become greater. As the year continues, fatigue will play a greater part in absenteeism.

Statistical standards used by various companies in arriving at absentee rates are by no means uniform. The wide differences in absentee rates between various companies, industries or groups, it is said, might be due in some measure to statistical treatment, rather than to actual absentee experience. Real statistics on absenteeism probably will not be available until industry, the union and the government arrive at definitions. The absentee rate during February may not be compared fairly with one during October or November. Companies have not yet built up enough statistics on the first seven days of absences to warrant clear-cut comparisons.

It Wasn't 12,500 Tons of Wire

• • • **An item** on page 134 of the last issue of this magazine stated that "12,500 tons of steel wire were given highest status" by WPB in an effort to aid farm implement makers. It was due to an error in transmission between our New York and Philadelphia offices that the word "wire" was included erroneously.

CUTTING A PATH... *TO VICTORY*

FROM the threat of abysmal global darkness, our world is gradually emerging into the Light of Freedom. The prospect of eventual Victory is but a reflection of America's collosal and unequalled capacity for production . . . *a record output that would be impossible without TOOLS!*

• LATROBE is proud to play its role through the development of quality high-speed steels, so vital to Industry's manifold cutting operations.

The service of Latrobe's highly specialized organization is at the command of every tool producer . . . with modern research, skilled engineering and timely technical assistance.

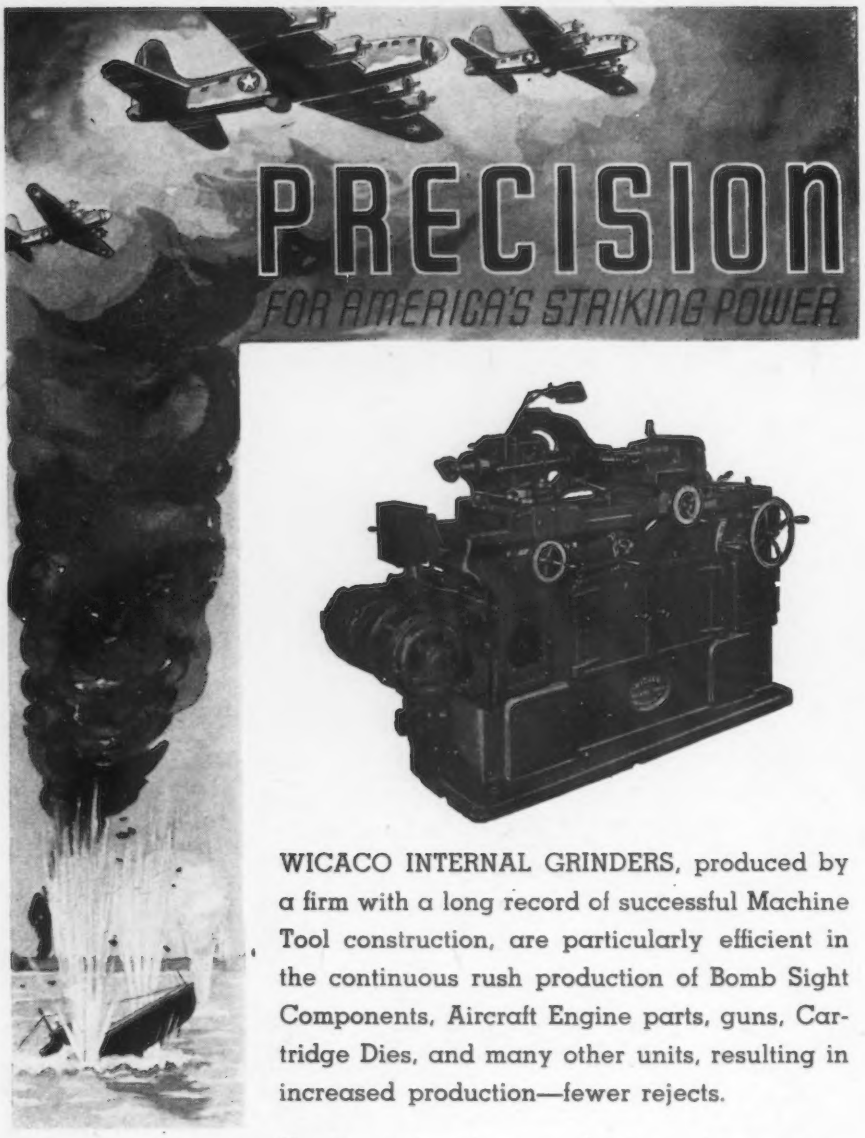
LESCO

HIGH SPEED STEELS FOR VICTORY

LATROBE

ELECTRIC STEEL COMPANY

MAIN OFFICES *and* PLANT . . . LATROBE • PA •



WICACO INTERNAL GRINDERS, produced by a firm with a long record of successful Machine Tool construction, are particularly efficient in the continuous rush production of Bomb Sight Components, Aircraft Engine parts, guns, Cartridge Dies, and many other units, resulting in increased production—fewer rejects.

Constructed with an underslung drive, vibration free and in constant tension—Rigid work head with oversize bearings—automatic reverse to speed up blind hole and shoulder work—Dynamic balance to all revolving parts—all of which spells PRECISION.

Deliveries can be made promptly under priority regulations, with electrical equipment ready to hook up and operate immediately. Write for complete descriptive matter.

INTERNAL GRINDERS

by

75th YEAR

THE WICACO MACHINE CORP.

WAYNE JUNCTION, PHILA., PA.

General Nelson or Big Shot Nelson; Who Is Nelson?

Chicago

• • • **Who is Donald Nelson? That question was asked recently in a national opinion poll. Nelson, WPB chief, related some of the answers in a recent address before the Economic Club here. The answers he listed were:**

He is a sort of a general.
He is OPA administrator.
He is food administrator.
He is a labor leader.
He is a big shot.
He is something in Washington.

Redistribution of Idle Goods Speeded By Heavy Demands

• • • **Spurring its efforts** to put more idle metals into war production, the WPB's redistribution division for Ohio, Kentucky, West Virginia and western Pennsylvania last week moved 5,879 tons of steel. The division also moved more than 14 tons of brass, copper, aluminum and other metals.

Examination of ledgers of 662 warehouses in the New York-New Jersey region resulted in making available quantities of more than 130 kinds of scarce critical materials urgently needed by war plants. Findings of the WPB men included metals ranging from steel to solder, and a wide variety of chemicals. Many of the materials found were so seriously needed that it was possible to conclude immediate negotiations for transfer to plants that required them.

The hunt turned up 3618 items of machinery and machine tools, 100 lb. of mercury, 60,117 lb. of copper, 1,960,681 lb. of magnesium, 814,680 lb. of steel (all forms), 212,000 lb. of tin and 61,448 lb. of welding rods.

Volkhardt to Head WPB Facilities Bureau

Washington

• • • **Charles E. Volkhardt**, executive vice-president of Harvey Hubbell, Inc., Bridgeport, Conn., last week was appointed Director of the WPB Facilities Bureau. He succeeds Fred Searls, Jr., who returned recently to his post in the War Shipping Administration. In addition to being an executive of Harvey Hubbell, Inc., Mr. Volkhardt is president of Wiring Devices Co., Inc., Lexington, Ky.

ALUMINUM HEADS

are just one of the many parts for America's fighting planes where Howard nonferrous castings are effecting weight savings—savings which impart higher speed or greater fire power, heavier bomb loads or more substantial armor.

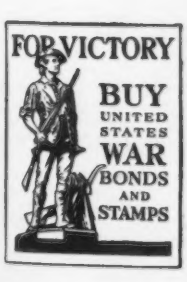
As the nation's largest jobbing producers of magnesium and nonferrous castings, much has been expected of us in the war effort. We are proud of delivering more than was expected in large tonnages of cast parts of magnesium, aluminum, brass and bronze for America's planes, tanks, tank destroyers, ordnance, ship and armament-making machinery.

Nonferrous castings from the three Howard foundries are proving their value today in a myriad of armament applications, many of which are quite new and of which nothing can now be told. These uses, however, are definitely indicating important peace-time applications for aluminum, brass, bronze and magnesium castings in which the Howard foundries are due to figure prominently.

May we help your armament production with better nonferrous castings?

For armament today — for utility tomorrow.

Howard Foundry Company
4900 Bloomingdale Road Chicago



HOWARD
ALUMINUM · BRASS · BRONZE · MAGNESIUM
CASTINGS

- *NEW* Principles of Design
- *NEW* Construction Features
- *NEW* Time Saving Methods

THE NEED for improved methods of washing metal parts has been brought to our attention repeatedly, over a period of many years, in dealing with a wide range of metal cleaning problems.

The advanced equipment we now offer is our answer to that need. By adding this new line of machines to our airless blast and airblast equipment, we are now the only manufacturer to offer *a complete metal cleaning engineering service.*

The new American metal washing machines include standard batch type mills and special machines for removing chips, dirt, grease, and oil from machined parts, stampings, screw machine products, etc.

High pressure sprays are used—and the equipment is designed for solvent emulsion degreasing or alkali cleaning and hot air drying. Various designs are available to include washing, rinsing, drying, and rust proofing.

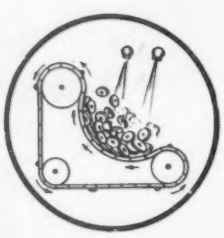
Tell us about your metal cleaning problem—we will be glad to help you in every possible way.

A NEW WAY

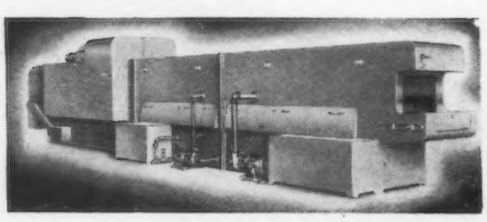
To Wash Metal Parts

The Tumbl-Spray Metal Washing Machine, described in this bulletin, cuts cleaning time and costs and does a better job, because the work is quickly and completely exposed to the sprays by means of an exclusive AMERICAN endless belt conveyor, as illustrated.

Write for Bulletin No. 9



Tumbl-Spray Cleaning chamber, which gently cascades and completely exposes the parts to the cleaning sprays.



Conveyor-Spray Machine to Wash, Rinse, and Dry Miscellaneous Work. The machine is composed of units which can be expanded to suit variations in production set ups. Many other models available.

TRADE MARK
THE AMERICAN MOLDER
REG. U. S. PAT. OFF.

Metal Washing Division

AMERICAN FOUNDRY EQUIPMENT CO.
Blast Cleaning and Dust Control Engineers

510 S. BYRK T ST. MISHAWAKA, IND.

Firestone Utilizes New Six-Stage Die

Detroit

• • • Wyandotte plant of Firestone Tire & Rubber Co. is in test production of ammunition belt links utilizing a new die, operating through six stages. The die was tested by Army and industrial officials who say it appears to be an improvement over the seven-stage die now in use and a four-stage die recently developed.

The progressive die was originated by John Drazick, president, Northeastern Tool & Die Corp., Detroit, who says it utilizes a narrower steel strip and eliminates formerly required trimming of about a third of the steel going through the machine.

WPB Announces Many New Personnel Changes

Washington

• • • Organization of the Office of Vice Chairman for Operations and appointments to key positions were announced last week by WPB Operations Vice Chairman Donald D. Davis. The following changes have been made in the WPB personnel:

John Hall, formerly director of the Construction and Utilities Bureau, is now deputy vice-chairman for Industry Operations.

Wade T. Childress, formerly deputy director general for Field Operations, will continue his same duties under the title of deputy vice-chairman for Field Operations.

John P. Gregg, formerly United States secretary of the Combined Production and Resources Board, has been named assistant deputy vice-chairman for Industry Operations.

James A. Folger continues his same duties with the new title of assistant deputy vice-chairman for Field Operations.

James Auten, formerly deputy director of the Construction and Utilities Bureau, succeeds John Hall as director of the Construction and Utilities Bureau.

Alexander C. Brown has resigned as deputy director of the Steel Division of WPB to return to his position as first vice-president of the Cleveland-Cliffs Iron Co., Cleveland.

Four new top positions created in the Office of Operations Vice Chairman have been filled as follows:

John Mohler, scheduling officer.
Joseph E. Adams, materials officer.
J. B. Walker, orders officer.
John H. Martin, program implementation officer.

Executives to Be Aided By War Department Branch

• • • The Industrial Services Division of the War Department has established a management branch, charged with assisting the executives in key war industries.

The new branch is under the direction of Maj. Keith L. Morgan, whose office is Room 2C-853, Pentagon Building, Washington, D. C.

"ONE OF THE IMPORTANT TOOLS IN AMERICA'S STEEL INDUSTRY"

Simanal

SILICON (20%)

MANGANESE (20%)

ALUMINUM (20%)

A HOMOGENEOUS FERRO-ALLOY, POSSESSING UNIQUE PROPERTIES AND ADVANTAGES IN THE MANUFACTURE OF BETTER STEELS FOR TODAY—AND TOMORROW

A Descriptive Folder is Available on request!

PHILO · DEPENDABILITY · QUALITY · SERVICE

RAINIR · DEPENDABILITY · QUALITY · SERVICE

Ohio Ferro-Alloys Corporation

Canton, Ohio

Chicago Detroit Pittsburgh Tacoma

Six Months versus Twenty Years Service *from Manganese Steel Chain*

This performance report from the tall timber savors so much of a Paul Bunyan tale that we would hesitate to release it if we did not have the evidence in our files.

Back in 1921 the superintendent of a California saw mill consulted our Oakland plant (one of Amsco's six foundries) regarding a chain used as a "hog-fuel" or refuse conveyor. The 1"x1⅝"x6" forged coil chains used for this purpose had been giving only six months service. The superintendent naturally regarded the recurring replacement costs as excessive, and he wanted to know what could be done about it.

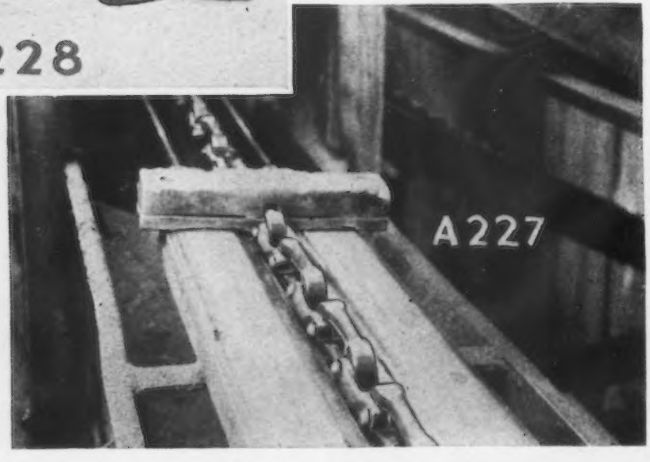
One of the engineers at our Oakland foundry worked out the riveted cast center-link and sidebar design shown in picture A-228, with the same general dimensions as the forged coil chain. The manganese steel chain shown in View A-227 was installed at the saw mill where it has been in service for over twenty years, latterly in log-haul-up duty. How much longer it will last is more than we would venture to predict.

The chain design as much as the durability of "the toughest steel known" figures in the twenty year record, having provided a much larger bearing area than that of the chain which it replaced. This, added to the tough stress resistance and the work-hardening property of austenitic manganese steel, accounts for the phenomenal performance.

The type of chain is now being used throughout the Pacific Coast area, for refuse conveying, log hauls and deck conveyors. Its durability is of particular value right now when conservation of metals is of extreme importance.

Amsco engineers are always prepared to make recommendations where equipment parts are not giving the performance that can reasonably be expected.

Amsco elevating and conveying chains are made in many types. Send for Bulletin No. 742-CN.



Amsco

AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Illinois

THE AMERICAN Brake Shoe AND FOUNDRY COMPANY

FOUNDRIES AT CHICAGO HEIGHTS, ILL.; NEW CASTLE, DEL.; DENVER, COLO.; OAKLAND, CALIF.; LOS ANGELES, CALIF.; ST LOUIS, MO.
OFFICES IN PRINCIPAL CITIES

Nelson Points to New WPB Flexibility and Cites Recent Savings

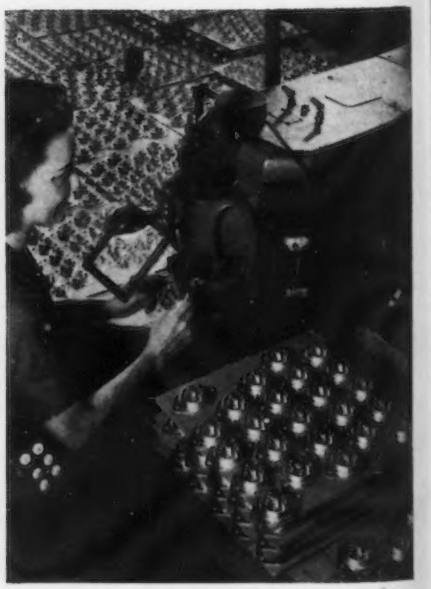
Chicago

• • • **The keynote of WPB** activities in the future, now that American war production is approaching "full blast" will be "flexibility," WPB Chief Donald M. Nelson declared here last week in an address before the Economic Club. Battlefront needs, Nelson explained, shift from day to day and month to month and must be met with corresponding shifts in war production.

Discussing the cooperation between industries and WPB, Nelson cited some of the cost reductions which have been brought about in the space of a few months. The M-4A1 tank, for example, is now being produced at a saving of 27 per cent over the cost of a few months ago. The Tommy gun today costs only a third of its cost a year ago. The Browning .50 cal. machine gun is now being produced at a saving of 46.5 per cent, and the Liberator bomber is being purchased today for 27 per cent less than it cost in 1942.

Nelson also warned that while at this time it is desirable not to curtail civilian production much further, there is no room yet for undue optimism.

THERMOSTATS AT WAR: Thermostats similar to those which controlled temperatures of electric irons today detect fires in warplanes, motor trouble in mechanized vehicles of war and overheating in battleship gun equipment. View taken in Westinghouse plant at Mansfield.



DOES ONE "Absentee Part" RETARD YOUR PRODUCTION?

"X" MARKS THE SPOT THAT BLOCKS PRODUCTION!

ARE schedules missed because one difficult *part* is hard to get? Do inspection rejections unbalance your production line because one *part* fails to meet quality standards? Does your war production suffer . . . is progress retarded on your new post-war product plans . . . because of "absentee parts"?

Contact KAYDON

High precision production of difficult parts . . . coordinating part design and production methods to speed output, improve utility, or lower costs . . . assuring "on time" deliveries to avoid "absenteeism" of parts . . . these are services the Kaydon organization offers, based on a sound background of engineering and precision manufacturing experience.

For excellence in production of extremely precise, unusually large ball and roller bearings.

ARMY E NAVY

THE KAYDON ENGINEERING CORP.

McCRACKEN STREET • MUSKEGON, MICH.

Specialists in Difficult Manufacturing

Acme for Action
The fast action of the speedy Jeep is serving many vital needs of our boys in the battle areas—helping bring nearer the Day of Victory.
And to help speed that Day of Victory, we at Acme welcome opportunities to try to break our own records in turning out the patterns, dies, gages, castings, and specialized tools needed by metal working war industries.
Our engineers, through their long experience, are frequently able to submit recommendations for specially designed tools to speed production line operations.
Submit your requirements, without obligation.
For VICTORY buy WAR BONDS and STAMPS
ARMY E NAVY
ACME PATTERN & TOOL COMPANY, Inc., DAYTON, OHIO
Heat-Treated Aluminum Aircraft Castings—Patterns —Tools—Tool Designing—Production Processing

Shipbuilding at New High Mark in March

• • • **Ship construction reached a new high in March with 146 new merchant vessels, totaling 1,516,000 deadweight tons. This surpasses the previous record set in February for 130 ships aggregating 1,239,200 tons. Of the total produced, 50.89 per cent were built in West Coast yards; 36.49 per cent on the East Coast, and 12.62 on the Gulf Coast.**

35 Bridges to Be Built On Alcan Highway in 1943

Toronto

• • • **More than 35 major bridges,** 90 per cent of them of steel construction, will be built along the Alcan highway this year. Some will be several hundred feet long, and it is estimated that more than 50,000 tons of steel will be required on the various undertakings. Most of the steel will have to be acquired from the United States, although some fabricating may be done in Canada.

Under a new order by the Canadian Steel Controller, production of ½-in. sq. reinforcing bars will be discontinued by Canadian mills.

Plans are underway whereby rolling stock orders involving several million dollars soon will be placed by the Canadian Pacific Railway Co. It is understood that Canadian Car & Foundry Co., Montreal, and National Steel Car Corp. Ltd., Hamilton, will share a large part of the contract.

ODT Sees Heavier Carloadings' Value Offset

• • • **Increases in the time** required for transit of railroad freight shipments, amounting in some cases to as much as 50 per cent compared with last summer, is a source of real concern to the ODT, Henry F. McCarthy, Director of Traffic Movement, declared in a recent address. The increased time required for turn-around of freight cars resulting from slowing down in transit has had the effect, Mr. McCarthy said, of a 4.2 per cent decrease in box car supply, compared with last year, and a decrease of 6.8 per cent in the size of the open-top car fleet. These adverse factors, he pointed out, offset gains in the field of heavier carloading and make necessary further transportation conservation.

McKAY

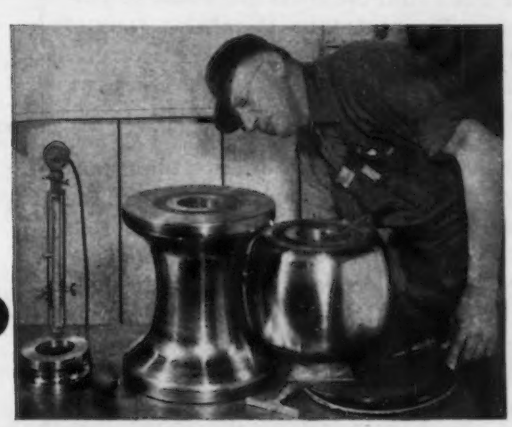
HARDENED ALLOY TOOL STEEL ROLLS

PROGRESSIVE engineering service plus skilled workmanship with precision tools and exceptionally rigid inspection standards, result in high grade rolls with a startling degree of accuracy and fine finish.

1 Profile turning to micrometer dimensions eliminates use of templates and increases accuracy.

2 Polishing operation insures smoothest finish obtainable.

3 Our own heat treating department is an important link in our complete roll service.

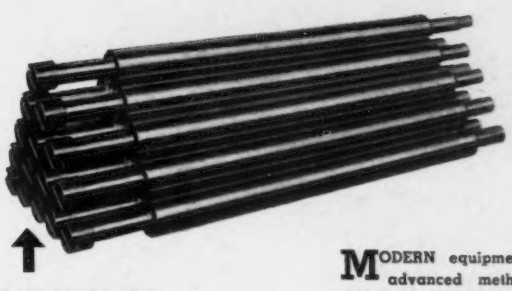


4 Rolls must pass our final rigid inspection.

5 One of 4 different methods of profile grinding insuring high degree of accuracy and fine finish.

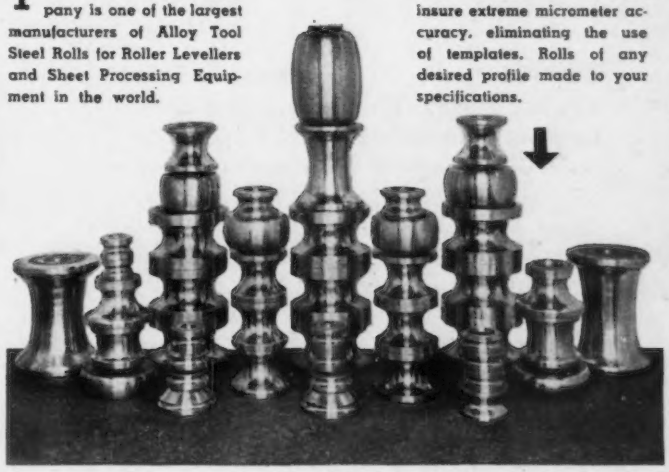
6 Bore grinding to close tolerance.

7 One of a battery of leveller roll grinders producing a mirror finish to close tolerance.



THE McKay Machine Company is one of the largest manufacturers of Alloy Tool Steel Rolls for Roller Levellers and Sheet Processing Equipment in the world.

MODERN equipment and advanced methods of profile turning and grinding insure extreme micrometer accuracy, eliminating the use of templates. Rolls of any desired profile made to your specifications.



ENGINEERS AND MANUFACTURERS OF

TUBE MILLS using . . .

ELECTRIC RESISTANCE WELD • OXY-ACETYLENE WELD • ATOMIC HYDROGEN WELD

COLD ROLL FORMING MACHINES

THE McKAY MACHINE COMPANY

YOUNGSTOWN • • • • • OHIO

ASSOCIATE COMPANY The WEAN ENGINEERING CO., Inc. • WARREN, OHIO

OUR Engineering Department is another vital link in our complete roll service. Consult our roll design engineers on any of your roll problems.

BUNDLES FOR THE AXIS

You've helped make up bundles for Britain, for Russia, for Greece. But here's how you can contribute to bundles for the Axis. Salvage all the scrap metal you can find. Then call in the nearest scrap metal dealer who will be glad to pay you for it and send it to the mills for processing. In this way you will help America and her Allies talk to the Axis with cold, hard steel . . . the only language they seem to understand.

Don't think the scrap metal situation is overemphasized. Here are the figures: 90 million tons of steel in 1943. That's the minimum the mills are asked to produce. To meet this, 45 million tons of scrap metal must be found. Scrap metal dealers, through their regular sources, furnish only 22 million tons.

Where are the other 23 million tons coming from? Every American knows the answer. There must be a continuation of the scrap metal campaign. Every pound of idle scrap must be salvaged and put to work. Go over your factory, your home carefully. Don't overlook anything. It's an individual responsibility.

Contribute your share NOW to "Bundles for the Axis."

THE ANDREWS STEEL CO.
NEWPORT, KENTUCKY
DIVISIONS
THE NEWPORT ROLLING MILL COMPANY
THE GLOBE IRON ROOFING & CORRUGATING CO.

Trade Notes . . .

N. A. Woodworth Co. and Suprex Gage Co., Ferndale, Mich., have appointed Brooke, Smith, French & Dorrance, Inc., to handle their advertising. Both companies are engaged in war production.

•

Mathews Heat Treating Co. has purchased a building at 8-12 Clifton Avenue, Newark, N. J. The company, recently organized, is engaged in heat treating of ferrous and nonferrous metals with oven type furnaces.

•

H. M. Harper Co., Chicago, has opened a factory branch in the I. N. Van Nuys Building, 210 West 7 Street, Los Angeles, with Mr. C. A. Gauger in charge.

•

Vibroscope, Inc., will be located at 6 East 39 Street, N. Y., after May 1.

•

Hercules Powder Co. has opened sales offices in the Statler Office Building, Boston, for its cellulose products, naval stores, synthetics, explosives and paper makers chemical departments.

•

Majestic Co., Huntington, Ind., has purchased the Brownie Mfg. Co. of Fort Wayne, Ind. The purchased company's complete manufacturing facilities have been moved to Huntington.

•

Ampco Metal, Inc., 1745 So. 38 St., Milwaukee, has been granted authority to build a $320,000 addition to its plant by the Defense Plant Corp. at Washington.

•

Mid City Foundry Co., Milwaukee, has purchased the foundry building and office of the former A. E. Martin Foundry Co. at 1521 Bruce St.

•

Headed by Richard W. Millar, former president and director of Vultee Aircraft, Inc., a new aircraft firm known as Avion, Inc., has been formed in Los Angeles. Other officers and directors include R. W. Palmer and Don I. Carroll, vice-presidents, both of whom resigned from Vultee late in 1942.

•

Philco Corp. by agreement with American Steel Export Co., Inc., has formed the Philco International Corp. with offices at 230 Park Avenue, New York, to handle sales in all countries outside the United States.

•

South Portland Shipbuilding Corp., South Portland, Me., has changed its name to the New England Shipbuilding Corp. There is no change in management.

•

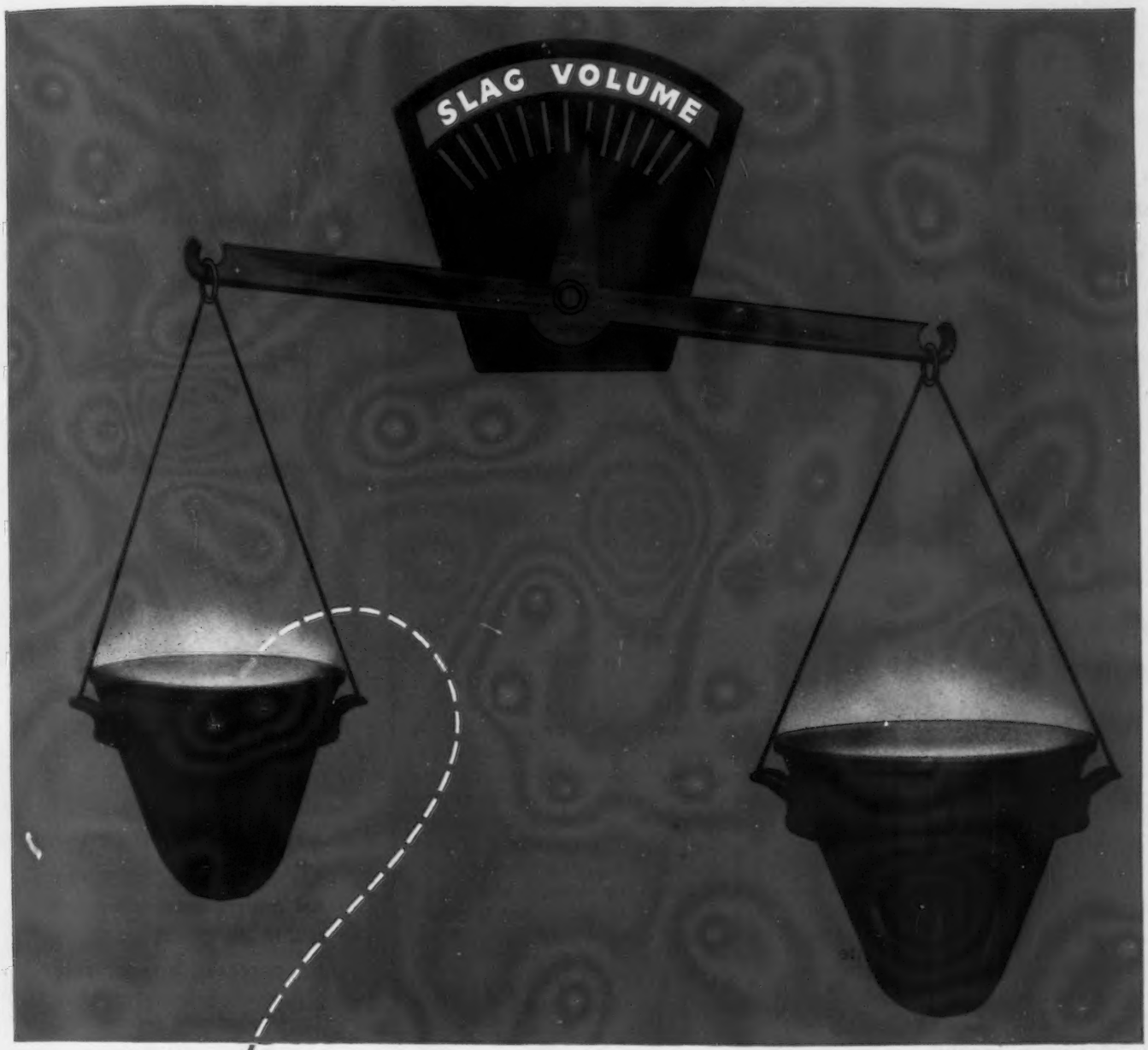
Koppers Co. New England district officers of the tar and chemical division have been moved to the Boston Consolidated Gas Building, Boston. Local offices will continue at Everett, Mass., East Providence, R. I., New Haven, Conn., and Portland. Maurice D. Gill will continue as manager of the New England district.

•

Manning, Maxwell & Moore, Inc., Bridgeport, Conn., has opened a new plant in Tulsa, Okla., to manufacture oil relief valves. The plant is now in operation with G. P. Kirchhofer as plant manager.

•

Extruded Plastics, Inc., Norwalk, Conn., announces the availability of "Tulox," a seamless plastic tubing available in all diameters up to 2½ in. o.d.



What benefits will a moderately leaner slag · · · and consequently less slag volume · · bring to you in your blast furnace practice?

TAKE ADVANTAGE OF THE INCREASED PRODUCTION MADE POSSIBLE THROUGH THE PROPER USE OF

SOLVAY Dustless Dense SODA ASH

SOLVAY SALES CORPORATION

Alkalies and Chemical Products Manufactured by The Solvay Process Company

40 RECTOR STREET NEW YORK, N. Y.

COMBINATION DRILL and TAP GRINDERS

This precision machine tool not only conserves Hi-Speed Taps and Drills, but also assures more accurate holes between regrindings.

Model 10-B sharpens Taps 2, 3 and 4 Flute, R.H. or L.H. Sizes No. 6 to 1½ inch.

Sharpens Drills 2 and 3 Flute, Straight or Taper Shank. Sizes from ⅛ to 1½ inch. Other combinations available.

Catalog on request.

GALLMEYER & LIVINGSTON CO.

200 Straight Ave. S.W.
GRAND RAPIDS, MICH.

GRAND RAPIDS

Republic Steel Sets Many New Records

• • • **Republic Steel Corp.** reported that its production of coke and pig iron in March had set new company records and its steel ingot output had reached 103.1 per cent of the theoretical capacity.

The corporation said coke production was 464,233 tons last month, compared with the previous peak of 416,415 tons in January, 1942, while pig iron production was 502,587 tons compared with the previous record of 482,265 tons last October.

The development of a special steel, used for making cartridge cases was one of the metallurgical accomplishments of Republic described in a recent letter to Republic stockholders. It was necessary to perfect a steel which had high drawing qualities, great elastic recovery and good corrosion resistance. The company started from the open hearth and perfected new pratices, with new rolling and annealing procedures.

The letter also pointed out that Republic made two notable contributions in the field of light armor plate: first was the method by which the plates are heat treated and processed in a continuous production line and, secondly, an improved method of shaping and cutting armor plate into pieces which can be welded together to make a finished tank body.

•

Inland Sets 15 Records

Chicago

• • • **Monthly production** of ingots at the Indiana Harbor plant of the Inland Steel Co. reached an all-time high during March, the previous record having been topped by 7749 net tons. In addition to the ingot production mark, 14 additional plant production records were established in March.

•

Bethlehem's Steel Output Sets New Monthly Record

• • • **Bethlehem Steel Co.** produced 1,113,500 tons of steel ingots last month, a new monthly record, according to an announcement made recently by Eugene G. Grace, president. The March record exceeded by 16,000 tons the company's previous high mark, set last October. The company's steel-making plants operated at 101.1 per cent of rated capacity.

"It should be pointed out," Mr. Grace said, "that this record was established in a period when about one-

• **FOR HIGH SPEED SAWING** STAR "MOLY"*—the original molybdenum alloy hack saw blade. You'll know it by its patented copper-color finish.

• **FOR DIFFICULT SAWING** STAR Unbreakable Special Flexible — the standard alloy blade that cuts like an all-hard, yet eliminates breakage and tooth strippage. Identify by all-over (patented) green finish.

TRADE MARK

CLEMSON BROS.
Incorporated
MIDDLETOWN, NEW YORK

**T.M. Reg.—Blades bearing the name "Moly" are made only by Clemson Bros., Inc., and affiliated companies.*

third of our output consisted of alloy and other special high-quality grades of steel for military uses which require more time in processing than ordinary steels."

•

7 Per Cent Ingot Gain Seen

• • • **Steel output** in 1943 is expected to reach an all-time record of 92 million net tons of ingots and castings, a gain of 6 million tons or 7 per cent over the record production of last year, according to latest estimates of the Bureau of Foreign and Domestic Commerce, Department of Commerce. Production during the first quarter of this year is estimated at 21.9 million tons.

•

J & L Makes New Records

Pittsburgh

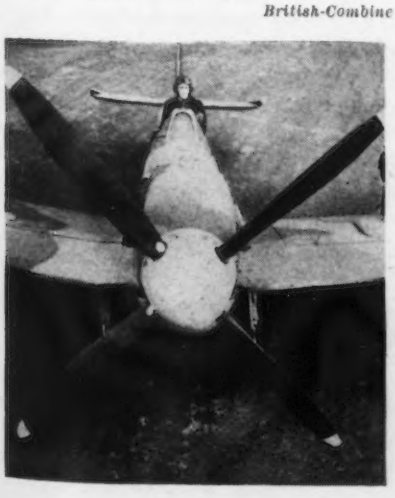
• • • **Indicating what** can be done with existing equipment (and for that matter old equipment), the Jones & Laughlin Steel Corp.'s 44-in. blooming mill at its Aliquippa Works rolled 171,440 tons of ingots in March. This is believed by the company to be a new world record, the previous one said to have been made on the same mill in October, 1942, when 161,074 tons of ingots were rolled.

The blooming mill was constructed in 1910.

The company also claims a world's record for Aliquippa's No. 3 blast furnace which was said to have produced 48,505 tons of iron, averaging 1565 tons a day during March. According to the company, this blast furnace was built in 1910, and is said to be equipped with ordinary old-style blowing equipment.

NEW SPITFIRE: Looking down on the new four-blade propeller Spitfire which now carries two cannon and four machine guns.

British-Combine



ROEBLING *Wires*

ROUND . . . FLAT . . . SHAPED

A FEW WIRES TYPICAL OF ROEBLING'S BROAD SPECIALTY PRODUCTION

FINISHED STEEL *That's ready to go!*

SHAPED WIRES

FLAT WIRE TO SPECIFICATIONS

ROUND WIRE FOR REINFORCING BATTLESHIP FUELING HOSES!

WOUND between the plies of built-up suction hose, this Roebling round wire provides a spiral backbone that gives the finished hose greater resistance to stretching, crushing, kinking . . . As ready-to-go as the battlewagons it helps refuel, it is typical of dozens of Roebling wires that are ready for your final production when you get them. To their manufacture, Roebling has brought all the skill of generations of wire craftsmen.

Have you a wire problem right now that Roebling's ready-to-use flat, round and shaped wires can help solve? If so, put it up to our facilities, knowledge and skill. Prompt action on war orders.

JAR ROEBLING

JOHN A. ROEBLING'S SONS COMPANY

TRENTON, NEW JERSEY · Branches and Warehouses in Principal Cities

. . WPB Answers to Questions

General

Will Prime Consumers and Secondary Consumers be informed of changes in the Class B Product List?

ANSWER—Yes, changes in the Class B Product List will be made by official amendments and publicized. However, no amendment in the present B List is contemplated for the Third Quarter of 1943.

A manufacturer of a Class A product requires a Class B product to be physically incorporated in his Class A product. The Class A product manufacturer fabricates the Class B product in his own shop instead of purchasing it. How does he obtain his material?

ANSWER—A person manufacturing a Class B product to be incorporated in a Class A product which he also manufactures must file a separate application on Form CMP-4B for material to manufacture the Class B product, just as though he were manufacturing the Class B product for another manufacturer.

See charts covering CMP pages 94, 95.

A service and repair shop needs to purchase replacement parts which are Class A products. How does the repair shop obtain these Class A products?

ANSWER—If the Class A products which the service and repair shop wishes to purchase are strictly repair and replacement parts they may be purchased without making an allotment to his supplier. Manufacturers of Class A products have been instructed to file a CMP-4B for controlled materials needed for the manufacture of repair and replacement parts.

A manufacturer claims to be a Class A producer for a product and a Class B producer for repair and replacement parts for the same product. What application forms should be used when both a Claimant Agency and civilian buyers use the repair parts?

ANSWER—The manufacturer should file a Form CMP-4A with the Claimant Agency for materials for the manufacture of the product, including material for repair parts ordered with the product. However, he should file a separate CMP-4A with the Claimant Agency for repair and replacement parts which are separately programmed. Requirements for repair and replacement parts which are purchased as needed by civilian buyers and Claimant Agencies should be covered by a CMP-4B filed with the WPB Industry Division.

We manufacture a product which requires a material other than a controlled material, which we can buy only with a preference rating. Part of our production requires a controlled material, part does not not. If a schedule is authorized covering only the part of our production using controlled materials, can we extend the rating (with the allotment number) for the noncontrolled material which we require for the rest of our production?

ANSWER—That part of your production requiring controlled materials must be covered by CMP-4A or CMP-4B applications. The authorized schedule will be your authority to purchase noncontrolled materials in the quantity needed for this part of your production only, and the preference ratings assigned may be used only for this part of your production.

For that part of your production not requiring controlled materials you may (1) use PRP ratings until July 1, 1943, if you are a PRP Unit, or (2) extend ratings received on orders.

Where is the official list of forms and shapes of controlled materials to be found?

ANSWER—The official list of forms and shapes of controlled materials is set forth in Schedule I of CMP Regulation No. 1. However, the definitions of the terms used and the code numbers are found in the November 14th booklet, "General Instructions On Bills of Materials," pages 22 to 35.

A manufacturer makes three different Class B products in the same plant and a separate CMP-4B has been filed with three different Industry Divisions for controlled materials. It is the practice to place an order with the steel mill for types and sizes of steel that are used in the manufacture of all three Class B products. Should three allotment numbers be shown? If so, does the portion of the order pertaining to each allotment number and product need to be shown?

ANSWER—The abbreviated allotment-number procedure specified in CMP Regulation No. 1 will considerably simplify this problem. While the allotment numbers received will vary in the last digits they will be the same as far as the letter and the first digit are concerned. The manufacturer, therefore, will probably be able to place one order with the steel mill using allotment number S-3. However, if a manufacturer gets three allotment numbers which are different in the letter or first digit then he must show on his purchase order each separate allotment number and opposite each allotment number the quantity applying.

COLOSSUS: Center section of a huge steel floating drydock is launched into the Hudson river at Newburgh, N. Y., by the Chicago Bridge & Iron Co., March 31.

Press Assn.

Allotments and Preference Ratings

Should a manufacturer use both the preference rating and the allotment number to obtain fabricated parts, sub-assemblies, or other mate-

Most Commonly Asked on CMP . .

rials needed in the manufacture of his product?

ANSWER—Yes, the certification prescriber in Paragraph (g) of CMP Regulation No. 3 provides for both a preference rating and an allotment number, or the manufacturer may use the optional general form of certification as prescribed in CMP Regulation No. 7 issued March 2, 1943.

Does CMP Regulation No. 3, in prohibiting extension of customers' ratings by Class B product producers, mean that a repair shop receiving an allotment on CMP-4B cannot extend ratings for resale items when these items are not a part of his repair service business?

ANSWER—The materials alloted on a CMP-4B to a repair shop are allotted specifically for the repair service business. The repair shop may extend his customers' ratings in conformity with applicable orders and regulations to obtain products which he sells as a distributor.

I require steel and copper in my product but I also require a material now under allocation, cadmium. Does my allotment number and preference rating give me the proper authority to order cadmium?

ANSWER—You are authorized to place orders for materials other than the three controlled materials in the quantity and at the time needed to complete your authorized production schedule. In the case of a material that is under allocation, you must file the same forms that have been required in the past. All E, L, M, and P orders remain in effect under CMP unless specifically amended or revoked.

I manufacture a Class A product. I have accepted orders bearing preference ratings of AA-1, AA-2X, and AA-3 up to my capacity for the month of May and have accepted allotments of controlled material required to fill these orders. I receive an additional order for this Class A product calling for delivery in May bearing a rating of AA-1 and an allotment of the necessary materials. Must I cancel one of the orders bearing AA-3 rating in order to make room for this AA-1 order?

ANSWER—No, you are directed by Paragraph (p) (2) of CMP Regulation No. 1 to reject orders and allotments if you do not expect to be able to make delivery of a Class A product by the requested delivery date. When a Class A product manufacturer has accepted orders up to his capacity he must also have received allotments to cover those orders. These allotments must be protected. Therefore, he is prohibited from accepting any additional orders and allotments.

In the above example, if I were making a Class B product, would the answer be the same?

ANSWER—No, in this case you must accept and fill the AA-1 order and cancel one of the AA-3 orders as directed by Paragraph (p) (3) of CMP Regulation No. 1. A manufacturer of Class B products receives allotments from his Industry Division rather than his customers (subject to certain exceptions). These allotments are made to cover his entire production of a Class B product and not necessarily to fill specific orders. Therefore, a Class B product producer must accept and fill orders according to the grade of preference rating which the orders carry.

Inventory and Inventory Adjustment

In applying the inventory controls set forth in CMP Regulation No. 2, what is meant by "item of controlled material?"

ANSWER—"Item of controlled material" is defined in CMP Regulation No. 2, Paragraph (a) (1) as "any item in any class of controlled material listed in the attached Schedule A which is different from all other items in that class by reason of one or more of its specifications, such as length, width, thickness, temper, alloy, finish, method of manufacture, etc." This means that each size, thickness, alloy, width, diameter of material is a separate item.

A manufacturer's authorized production schedule will require him to use 10 tons of carbon steel rods of various sizes during a 60-day period. His aggregate inventory of all sizes of these rods exceeds 10 tons, but his inventory of one specific size of rod amounts to only a two-week supply. May he accept delivery of an additional quantity of this particular size sufficient to bring him up to a 60-day inventory of that size?

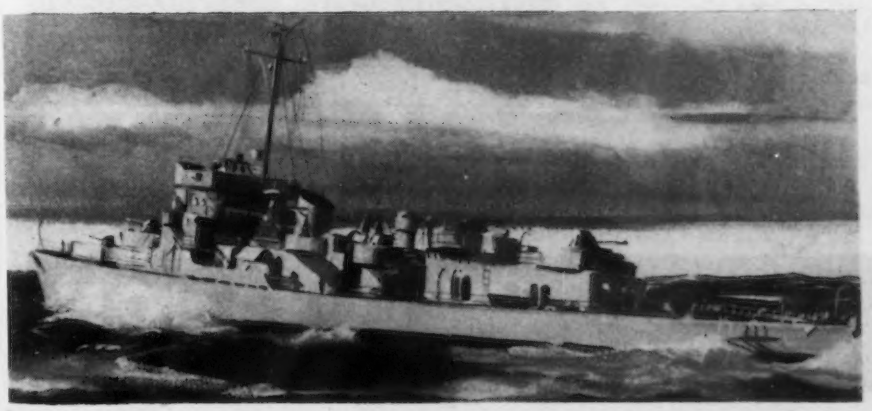
ANSWER—The inventory control of CMP Regulation No. 2 applies specifically to each item of controlled material. Each different size of rod is a different item, and therefore, the fact that the manufacturer has more than a 60-day supply of one size does not prevent his accepting delivery of a size of which he has less than a 60-day supply.

We are a company manufacturing metal stamping and, because of our short cycle, we have been able to get along on a 30-day inventory. Under CMP may we increase our materials inventory to a 60-day supply?

ANSWER—The 60-day maximum limitation in Paragraph (b) (1) of CMP Regulation No. 2 is only a maximum or ceiling inventory. Paragraph (b) (3) further prescribes that no one may maintain an inventory in excess of a minimum practicable working inventory. Therefore, your permissible inventory would be a 30-day stock.

A company doing industrial repair work has to keep an inventory of many sizes and kinds of copper wire.

NEW ANTI-SUB WEAPON: Here's the first glimpse the Navy has permitted of its new Destroyer Escort vessel, designed to meet the marauding U-Boat. It is smaller than a destroyer but fast and powerful.



About 25% of the items are fast moving and the rate of use of these items can be calculated with reasonable accuracy. However, 75% of the items are slow moving and the rate of use of these items is not predictable. As this company does considerable emergency repair work, it is essential to carry these slow moving sizes in sufficient quantity to meet unpredictable demands. How can this company operate under CMP Regulation No. 2?

ANSWER—With regard to material needed for uses which are authorized but which are not specifically predictable, CMP Regulation No. 2 permits a company to have on hand at any time the amount of each item which it estimates it must have in order to meet the demands which it reasonably anticipates arising during the next 60 days. In computing the amount which it is considered necessary to have on hand, the estimates should be based on past experience of use, the possibility of obtaining material from warehouses, and upon the length of time required to obtain delivery from producers under CMP. Acceptance of delivery of controlled materials must be in such quantities that the limitations described above will not be exceeded.

This standard need only be applied when the amount which the company wishes to receive is greater than the allowable minimum shown on Schedule A of the Regulation.

A 60-day inventory of a particular size of carbon steel bars would be 4 tons for a certain manufacturer. He now has 2 tons in inventory. The minimum which the manufacturer can obtain from his supplier is 4 tons. May he accept delivery of the 4 tons?

ANSWER—Receipt of the additional 4 tons would bring this manufacturer's inventory to 6 tons, which is in excess of the 60-day ceiling. However, this manufacturer may receive the 4 tons additional, as this quantity is less than the minimum quantity (10,000 lbs.) for this product shown in Schedule A of CMP Regulation No. 2. We assume, of course, that this manufacturer has an allotment covering the 4 tons to be received.

We use controlled materials for maintenance, repair and operating supplies only. Must we fill out Form CMP-7?

ANSWER—Yes, if requested to do so, a person who uses controlled materials for maintenance, repair and operating supplies only must file Form CMP-7.

May a manufacturer accept delivery of a controlled material if his order is delivered by the mill ahead of the specific date that delivery was requested, if such acceptance would run his inventory over 60 days?

ANSWER—In this case, the manufacturer may accept delivery of this item of controlled material. This is provided for in paragraph (c) (1) of CMP Regulation No. 2.

In filling out Form CMP-7, should we include in Section B maintenance, repair and operating supplies in inventory as well as production materials?

ANSWER—Yes, report all items of controlled materials in the forms listed.

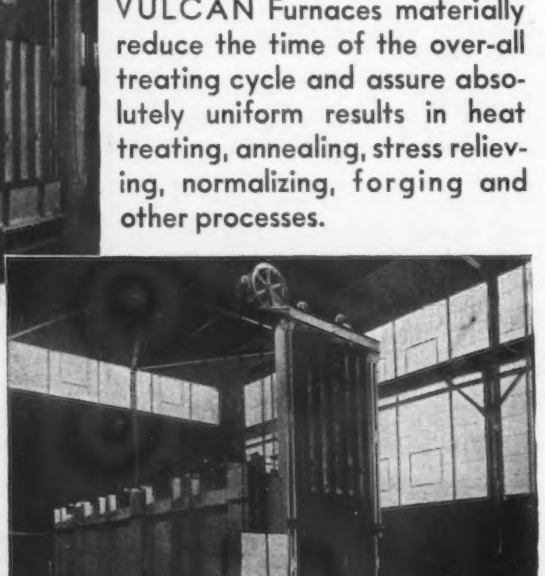
What do companies do who reply "no" to both Item 1 and Item 2 on Form CMP-7?

ANSWER—If the answer to Item 1 and Item 2 on Form CMP-7 is "no" it is necessary to fill in the heading of the Form only, sign the certification at the bottom of the page, and return it to the War Production Board.

We have been told that the manu-

VULCAN *Means Greater Capacity, Speed and Accuracy . . . in All Heat Treating and Heating Operations!*

Through better methods of heating and firing, and greater efficiency in applying temperature and pressure controls, particularly in large-capacity units, VULCAN Furnaces materially reduce the time of the over-all treating cycle and assure absolutely uniform results in heat treating, annealing, stress relieving, normalizing, forging and other processes.



ABOVE—VULCAN Car Hearth Furnace for heat treating, normalizing and annealing steel parts of various sizes, shapes and sections. Quenching from car, which is motor operated. Temperature range: 800° F. to 2,000° F. May be oil or gas fired.

RIGHT—VULCAN Car Hearth Furnace for heat treating a variety of large steel parts, and for bright annealing steel strip in coils. Temperature range: 800° F. to 1,800° F. May be oil or gas fired.

Although VULCAN Furnaces are custom-built to produce specific results, *they cost no more* than furnaces of standard design. Furthermore the time required for design, construction and installation is less than ordinarily required. Send for Bulletin V.

VULCAN CORPORATION
NORTH 18TH & CHERRY STS., PHILADELPHIA, PA.

Do You Have Queries Concerning New CMP?

• • • Do you have questions concerning operations of the Controlled Materials Plan? If so, send them promptly to the news editor of THE IRON AGE, 100 East 42d Street, New York, and efforts will be made to obtain authoritative answers as quickly as possible. If the questions are of general interest, they may be published with the official replies.

facturer must now make his own inventory adjustments when filing Forms CMP-4A and CMP-4B. How is this done?

ANSWER—Columns 5 through 8 of Section B—Purchase Schedule—of the CMP-4A and CMP-4B application forms are headed "Required from Suppliers" and "Requirements" respectively. For this purpose "Required" means the quantity required to be brought into the plant, that is the quantity for which authority to purchase is wanted. If a manufacturer actually expects to use or "chew up" 10 tons in a quarter and he can take 5 tons of this from his inventory, he will only "require" 5 tons. He will, therefore, show 5 tons as required to be purchased in the quarter.

Column 4 in Section B of these two forms headed "To Be Put Into Production" should be filled in with the quantity actually to be used or "chewed up" irrespective of whether it is to come from inventory or outside.

MRO—CMP Regulation No. 5

CMP Regulation No. 5 states that "repair" means the restoration of a facility to sound working conditions when it has been rendered unsafe or unfit for service by wear and tear, damage, failure of parts or the like. May I obtain a new boiler costing $2,000 under the procedures provided in the regulation to replace a boiler which has been damaged beyond repair?

ANSWER — No. A boiler which is damaged beyond repair and which costs in excess of $500 to replace cannot be obtained under the provisions of this regulation. However, your attention is called to paragraph (b) (3) of the regulation which permits minor items of productive capital equipment, minor capital additions or replacements not exceeding $500 to be included as maintenance, repair and operating supplies.

We have an allotment of 50 tons of carbon steel for production and as a schedule 1 industry, we require 5 tons for maintenance, repair and operating supplies. Can we combine these requirements on a single purchase order and purchase the 55 tons from a mill?

ANSWER—Yes, it is permissible to combine the requirements for both purposes on a single purchase order. However, the purchase order must indicate the amount to be used for production, together with the applicable allotment number, and it must also indicate the amount to be used for maintenance, repair and operating supplies.

I am a manufacturer of a product listed in schedule I of CMP Regulation No. 5 which entitles me to a rating of AA-1 for maintenance, repair and operating supplies. I operate several branches which act as

HOW DO *YOU* BUY BELTING?

Do you pay so much a foot, and get just belting? That way is expensive, if the belting cannot stand up against abuse and "green help" and still deliver maximum performance.

The economical way to buy belting is to specify—SCHIEREN! Into every one of our belts we incorporate over 75 years of "know how." And every step in the building of a SCHIEREN BELT—from the treatment of the leather fibres . . . to the cementing together of perfectly tanned sections—is performed by our craftsmen with the purpose of delivering maximum power, under adverse conditions, for years and years of dependable service.

You can settle the belting question for yourself, permanently. Take any two similar drives. Place a SCHIEREN LEATHER BELT on one of them. The better performance and longer life of the SCHIEREN PRODUCT will convince even a skeptic. When would you like that demonstration? There is a distributor near you, or write—CHAS. A. SCHIEREN COMPANY, 36 Ferry St., New York, N. Y.—60 Front St. W., Toronto, Canada.

SCHIEREN
DUXBAK BELTING
TRADE MARK

LEATHER BELTINGS • SPECIALTIES AND HYDRAULIC PACKINGS

CHICAGO - SALT LAKE CITY - LOWELL - DENVER - DALLAS
NEW YORK - PITTSBURGH - PHILADELPHIA - NEWARK

sales outlets and service organizations for my product. May I use the AA-1 rating for maintenance and repair items necessary for the upkeep of these branch offices?

ANSWER—Ratings assigned for the procurement of MRO may be used only to procure material for the maintenance, repair and operation of the plant carrying on the production, and may not be used for the upkeep and operation of sales and service offices.

May jigs, dies, and fixtures be considered operating supplies as defined in CMP Regulation No. 5, and if so is there any restriction on the dollar amount that may be spent for such items?

ANSWER—If such jigs, dies and fixtures are charged to operating expense according to establishing accouting procedure in an individual plant, they may be purchased as maintenance, repair and operating supplies without regard to the amount of expense involved. If, however, the accounting practice of the individual plant has been to capitalize such items they may not be obtained as maintenance, repair and operating supplies except to the extent permitted by Paragraph (b) (3) of CMP Regulation No. 5 which permits the purchase of minor items of productive capital equipment and minor capital additions of replacements up to $500 in value per item.

What quantity restrictions are imposed on the purchase of maintenance, repair and operating supplies under CMP Regulation No. 5?

ANSWER—A person who spent $100,000 for maintenance, repair and operating supplies during 1942 may obtain during each calendar quarter not more than $25,000 worth of MRO or an amount not exceeding the aggregate expenditures for maintenance, repair and operating supplies for the corresponding calendar quarter of 1942. In no case may any person use the MRO allotment symbol or preference rating to obtain material during the twelve months ending March 31, 1944 in an amount exceeding the aggregate expenditures for MRO during the calendar year 1942 (or the fiscal year ending nearest to December 31, 1942).

In the case of a plant not in operation during 1942, a person may take as a base for figuring his expenditures for maintenance, repair and operating supplies the amount spent for such purposes during the First Quarter of 1943 or during the portion of the First Quarter of 1943 when the plant was in operation, reasonably adjusted for seasonal or other variable factors, provided that he first notifies the WPB in writing of the base which he is taking, the reasons therefor, and the nature of any adjustments made.

A plant starting operations after February 28, 1943 may spend up to $5,000 per quarter for maintenance, repair and operating supplies without restriction. If more than $5,000 per quarter is required, application must be made in writing to WPB for a specific quota.

If the expenditures permitted for MRO described above are not sufficient to take care of essential operations, what procedure should be followed to obtain permission to spend more?

ANSWER—Application should be made in writing for additional assistance to the appropriate Industry Division, War Production Board, Ref.: CMP Regulation No. 5.

How large an inventory of maintenance, repair and operating supplies may a person maintain?

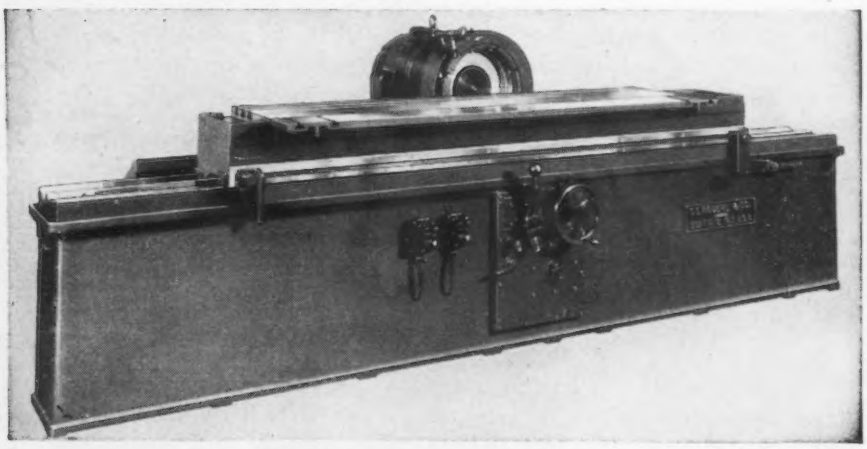
Specially designed for .....STEADY, FAST PRODUCTION of LONG NARROW and LIGHT WORK

MODEL ROGERS NT-20

ROGERS FACE GRINDER

This new model traveling table face grinder, ruggedly built for relentless production, takes work 10″ to 12″ high. Table length is 72″, width 16″. A 10 H.P. motor mounts a 20″ cylinder grinding wheel for medium duty service. Two-speed table traverse powered by 3 H.P. motor.

Built and guaranteed by a company with 57 years' experience as manufacturers of grinding machinery.
Send for Circular NT-20. Also manufacturers of knife grinding and saw sharpening equipment.



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215 Dutton Ave. Buffalo, N. Y.

ROGERS GRINDERS
PRECISION QUALITY SINCE 1887

NEW

Sav-way

HYDRAULIC INTERNAL GRINDER

Embodying features not to be found in any other one machine will be announced soon...

See May 13th Issue

of this publication for further information

Sav-way INDUSTRIES

* Machine Tool Division *

4967 EAST EIGHT MILE · DETROIT, MICHIGAN

ANSWER—The inventory restrictions as set forth in Priorities Regulation No. 1 and CMP Regulation No. 2 apply to maintenance, repair and operating supplies the same as to all other materials.

What is the effect of CMP Regulation No. 5 on existing P Orders regulating the procurement of maintenance, repair and operating supplies for specific industries or activities?

ANSWER—In general, these P Orders will remain in effect and the provisions contained in them will continue to be operative until changed or revoked. The regulation affects these P Orders as follows: (a) When a person using the MRO certification for controlled materials is covered by a P Order he must also show the number of such P Order; (b) The restrictions as to the amount of expenditure for maintenance, repair and operating supplies specified in CMP Regulation No. 5 apply in addition to any quantitative restrictions contained in any P Order unless the particular P Order expressly provides that the restrictions of CMP Regulation No. 5 shall be inapplicable; (c) The preference ratings assigned by the regulation supersede the preference ratings assigned by all P Orders for MRO with respect to materials or products to be delived after March 31, 1943, except as may be otherwise provided by amendments to such orders specifically providing to the contrary; (d) All other terms, provisions, and restrictions in all P Orders covering maintenance, repair and operating supplies, including definitions, requirements for making applications, and filing reports remain in force until modified or revoked; (e) In addition each person, who, in accordance with existing priorities procedures not covered by P Orders, is required to file applications or reports with respect to his requirements for, or use of, maintenance, repair or operating supplies, or is limited in the amount of such supplies which he is permitted to acquire or use, shall continue to comply with such procedures until revoked.

How may a person appeal for relief from any of the provisions or restrictions of the MOR regulation, CMP Regulation No. 5?

ANSWER—Appeals from any of the provisions or restrictions of the regulation, such as requests for change in classification from Schedule II to Schedule I, or requests to be placed on either Schedule I or Schedule II if not listed in either schedule, or appeals from the quantity restrictions contained in the regulation, may be filed with the appropriate division.

Transition From PRP TO CMP

A PRP Unit was authorized to receive 1,000 tons of carbon steel for the First Quarter of 1943 for production materials. How much carbon steel may the Unit purchase and receive in the Second Quarter?

ANSWER—The PRP Unit may place rated purchase orders, using its first quarter production material ratings, for 700 tons of carbon steel or 70% of its First Quarter Authorization for receipt in the Second Quarter. If by March 31, 1943 it has not been specifically advised to the contrary by the War Production Board it may then place rated orders for and receive the remaining 30%, or 300 tons.

A PRP Unit was authorized to receive 1,000 tons of carbon steel for production material in the First Quarter of 1943. On April 1st a CMP

NEW REEVES *Reducer-Type* TRANSMISSION

• Combines Variable Speed Mechanism and Gear Reducer In Single Compact Unit.

★ This new REEVES unit consists of the REEVES Variable Speed Transmission and built-in speed reducer. Provides accurate speed adjustability and speed reduction without use of other auxiliary speed reducing equipment. Compact, space-saving. In horizontal or vertical designs for mounting in any desired position. Each design offered in wide range of speeds and sizes from 1 to 7½ h.p. inclusive. Transmission in various sizes provides ratios of speed change 2:1 through 12:1 and reducer provides ratios to and including 6.9:1. May be equipped for individual motor drive by use of REEVES motor base, adjustable to accommodate any standard make motor. Get full details of this efficient new REEVES drive. Write for Catalog ITR-432.

REEVES PULLEY CO., COLUMBUS, INDIANA

Reeves Speed Control

WIZARD OF WEIGHING—Dr. Halvor O. Hem, our Chief Consulting Engineer, is dean of the 65-man Toledo Scale research and engineering group. Personally responsible for many far-reaching developments in weighing, testing, force-measuring. Norwegian-born; a forthright U. S. citizen for 40 years; a Toledo man for 28 of them.

RESEARCH IS TIPPING THE SCALES OF WAR AND WILL SET THE STYLE OF A PERMANENT PEACE

Buttressing our far-flung fronts stand the services of Supply. Behind Supply roars Production—*mass-production.* Guiding Production is Engineering, converter of ideas into things—*fighting things.*

Fountain-head of Engineering is Research—"the science of making changes in a scientific way."* Research in its silent scientific way seeks out the solution to the Front Line's constant cry, "Give us more—and better."

To us War Research has meant:
Wind-tunnels that dictate the shapes of super fighters and bombers;
Engine-testers that telegraph the pulse, respiration and metabolic rate of the plane's engines; helping the engineer to better their fighting fitness;
Propeller-balancers that speak for higher speeds and safer handling in the air;
Electronic explosives-batch controls that robot the compounding of ammunition at war-tempo speed and to gnat's-eyebrow accuracy.

These, and dozens of other war-born weighing, testing and force-measuring devices, are war machines in which Toledo Research plays its part.

Research the Change-maker is tipping the Scales of War; and will set the style of the Peace to follow. For Research the War-winner will also be the Job-maker in the Peace that must, by right and might, be ours tomorrow.

TOLEDO SCALE COMPANY

Toledo, Ohio

Canadian Toledo Scale Co., Limited, Toronto, Ont.

*As defined by that great proponent of Research, C. F. Kettering.

allotment of 500 tons of carbon steel is made to this company. How much carbon steel may the Unit receive during the Second Quarter?

ANSWER—The PRP Unit may receive a total of 1,000 tons during the second quarter. It may rate and receive the entire 1,000 tons through the use of its PRP ratings, or it may use the CMP allotment for 500 tons and PRP ratings for the remaining 500 tons.

In the above example, assume that the PRP Unit receives a CMP allotment of 1,200 tons of carbon steel on April 1st. How much carbon steel may the Unit receive during the Second Quarter?

ANSWER — In this case the PRP Unit may use the CMP allotment for the purchase and receipt of a total of 1,200 tons. It must not duplicate purchases under PRP and CMP.

A PRP Unit was authorized to receive 1,000 tons of carbon steel on its PD-25A certificate for the First Quarter of 1943. On February 10th it received a PD-25F certificate authorizing an additional 200 tons for receipt in the First Quarter. On March 5th a PD-25F certificate authorized an additional 100 tons for receipt in the First Quarter. How many tons of carbon steel may the PRP Unit purchase for delivery in the Second Quarter?

ANSWER—The basis to be used for determining the quantity of steel which may be purchased for receipt in the Second Quarter is the 1,000 tons authorized on the PD-25A certificate plus 200 tons authorized on the first PD-25F certificate received on February 10th. The 100 tons authorized on the PD-25F issued on March 5th may *not* be included since this PD-25F was issued after February 28th. Priorities Regulation 11A states that each PRP Unit may apply production material ratings authorized for the First Quarter of 1943 to 70% of the quantities of listed materials for production to which it was authorized to apply ratings by the First Quarter PD-25A plus First Quarter PD-25F certificates issued prior to March 1st. Therefore, at any time prior to April 1st, the PRP Unit may place rated purchase orders for delivery in the Second Quarter of 840 tons of steel (70% of 1,200 tons). Unless it has been specifically advised to the contrary, prior to April 1, 1943, it may then place orders for 360 tons, the remainder of the 1,200 tons total.

A PRP Unit was authorized $10,000 in the First Quarter of 1943 for "maintenance, repair and operating supplies not elsewhere classified." How much maintenance, repair and operating supplies may the PRP Unit purchase in the First Quarter of 1943, and in the Second Quarter of 1943?

ANSWER—Maintenance, repair and operating supplies purchased for delivery in the First Quarter are governed by the terms of the PRP Regulation, Priorities Regulation No. 11.

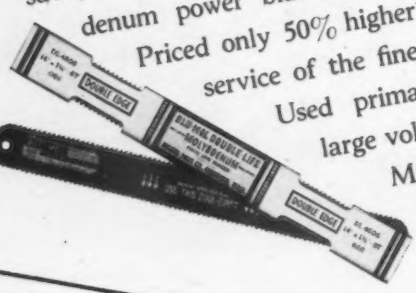
CMP Regulation No. 5 governs the procurement of maintenance, repair and operating supplies for delivery after March 31, 1943. Any purchases of maintenance, repair and operating supplies requiring delivery after March 31st are covered by the terms and provisions of that regulation.

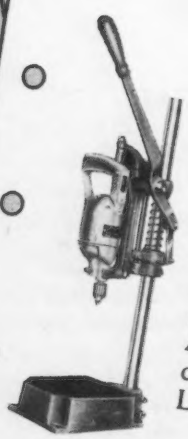
In this case the PRP Unit may purchase $10,000 worth of maintenance, repair and operating supplies for delivery in the First Quarter and the quantity it may purchase for delivery in the Second Quarter is governed by the terms of CMP Regulation No. 5.

KNOW YOUR TOOLS

by MILLERS FALLS

A REVOLUTIONARY development in power hack saws, Blu-Mol "Double-Life" is a high speed molybdenum power blade with teeth on *both* edges. Priced only 50% higher, it delivers *twice* the service of the finest single-edge blades. Used primarily by plants doing large volume of cutting. Typical Millers Falls quality. For hand sawing, use Blu-Mol singles.





18 ELECTRIC drills make up the present Millers Falls line; Model No. 314 (*Illustrated*) is ideally suited to countless jobs in automotive, plumbing, wood working, heating and ventilating, and general maintenance work. Powerfully motored to sink ¼" holes in mild steel at 2" per min. 110 volts AC or DC. No-load speed 2750 r.p.m. Key chuck. Working parts chrome nickel steel. Lever feed stand makes it an inexpensive, high-performance drill press for home or shop.

MILLERS FALLS TOOLS SINCE 1868

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Delivery 4 Weeks

TYPE "CO" SELF-OPENING DIE HEAD

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Call Detroit
CHERRY 2216

Quick delivery of precision threading tools is something to make note of in these days of unsurpassed production in manufacturing plants.

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Briefly Told—

All-Rail Ore Route Is Ordered Continued; Other Industrial News

• **The customary all-rail movement of iron ore from Minnesota mines to southern Illinois will be continued. The proposal to divert shipments to river barge has been rejected by the Office of Defense Transportation after an investigation which found that because of the large increase since 1942 in traffic on the inland waterways and the limited supply of barges, the loading of 350,000 tons of iron ore southbound would have the effect of materially impairing the ability of the barge lines to handle coal northbound.**

•

• **Landing gear struts** for airplanes are chromium plated faster by using a tube of "Lucite" methyl methacrylate resin to protect the treated end during plating, the plastics department of E. I. du Pont de Nemours & Co. reports.

•

• **Award of the company's** 50-year medal to L. N. Aller, secretary-treasurer, brought to 15 the number of men now living who have been employed by the Taylor-Wharton Iron & Steel Co. for 50 years or more, George R. Hanks, president, announced recently.

•

• *Speaking on the G-E Science Forum at Schenectady recently, C. C. Bailey, of General Electric Co.'s transportation department, said that wartime research has developed a freight car journal bearing which may result in the reclamation of many thousand tons of critical metals from the conventional bearing now used. He said the standard freight car journal, 25 lb. of bronze, seems to bear promise as a veritable gold mine. Copper, lead, tin and antimony will also be saved.*

•

• **The members** of the Porcelain Enamel Institute met at Cincinnati, March 23, to lay out a plan for peacetime operation. George D. Crabbs, chairman of the board, Philip Carey Mfg. Co., Cincinnati, presented the program of the Committee on Economic Development and recommended that industry make special plans to re-employ returning men from the armed forces.

•

• **An increasing shortage of trailers to handle farm produce was reported by the truck trailer industry advisory committee at a meeting held with the officials of the WPB and other government agencies.**

•

• *Payrolls of the steel industry in February were below the January peak, according to a report by the American Iron and Steel Institute. The industry distributed $122,759,000 in payrolls during February, as against $129,760,000 in January. Employment averaged 635,000 in February against 637,000 in January.*

•

• **Foremen, melters, and first and second helpers on electric furnaces will have an opportunity to discuss electric furnace steel making problems in special sessions of the Electric Metal Makers Guild sectional meeting at the Hotel Morrison, in Chicago, on May 1. Two separate**

PERKINS MAN COOLERS

TRADE MARK REGISTERED UNITED STATES PATENT OFFICE

SAVE VALUABLE WORK HOURS

Perkins Man Coolers keep men cool. Comfortable workers produce more. Give them a steady re-circulation of air.

Perkins Man Coolers are made in stationary and oscillating types, both portable.

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More Speed for AIRCRAFT RIVETING

NEW AIR POWERED

RIVITOR

HANDLES FLUSH RIVETING

To "keep 'em riveting" with *increased speed*... install the new T-J Air Powered RIVITOR! Combines "air squeeze" action with automatic feed riveting to meet today's aircraft production needs.

Does a speedy, efficient job of flush riveting ...averaging 1600 riveted joints per hour with no manual rivet handling. By using a different type of rivet set and jaw construction, can be adapted for handling Counter Sunk Head, Flat Head, Round Head, Full and Semi-Brazier Head Rivets. Write for latest bulletin.
The Tomkins-Johnson Co., Jackson, Michigan.

This Rivitor also available in "Twin" types for setting two rivets at the same time.

FOR TOUGH JOBS...SPECIFY T-J

TOMKINS-JOHNSON

RIVITORS...AIR AND HYDRAULIC CYLINDERS...CUTTERS...CLINCHORS

conferences, one on ingots and one on castings, will meet during the day followed by a joint session in the evening.

•

• In the first three months of 1943 a total of $49,278,150 in new war plant facilities was added to the industrial resources of the Chicago area.

•

• *General Motors total 1942 sales of $2,250,548,859, of which $1,898,195,445 represented war material products, nearly equaled the value of total sales of $2,436,800,977 in 1941, peak year. The Corporation has voluntarily effected reductions of $361,288,825 in war contract prices. Inventories at the end of 1942 totaled $466,265,585, an increase of $133,438,811 during the year.*

•

• The necessity for reducing the amount of critical alloy metals used in the production of cast steel, cast iron, malleable iron and highly-alloyed castings was discussed at a recent meeting of the Ferrous Foundry Industry Advisory Committee with officials of the WPB Steel Division. One of the possibilities discussed is the standardization or simplification of formulas used in metallurgical practices.

•

• *School teachers, bank clerks, postal employees and other "white collar" workers are helping to alleviate the local manpower shortage in Fairfield, Conn., by working a 4-hr. shift every night at the machine tool building plant of J. L. Lucas & Son, Inc. A high school shop instructor is teaching them their new trade, in which none had previous experience.*

•

• The NWLB decided last week, by a vote of 10-2 (CIO members dissenting) to put the state of Virginia in Region 4, with headquarters at Atlanta. Virginia has been heretofore in Region 3 with headquarters in Philadelphia. The change was made for purposes of greater administrative efficiency.

•

• Revised lists of activities essential to carrying on the war have been issued by WMC for the use of U. S. Employment offices and Selective Service boards.

•

• The N. E. Regional Conference to be held May 1 at the Hotel Bond in Hartford, Conn., will include a metal finishing clinic and a talk by Arthur Zavarella, materials engineer, Springfield Armory, Springfield, Mass., on ordnance finishing of small arms.

NEED EQUIPMENT for...
Galvanizing? (Electro Process)
...ASK MEAKER!
Plating?
...ASK MEAKER!
Cleaning?
...ASK MEAKER!
Pickling?
...ASK MEAKER!
Do It MECHANICALLY—Save Labor, Up Production!
The MEAKER CO.
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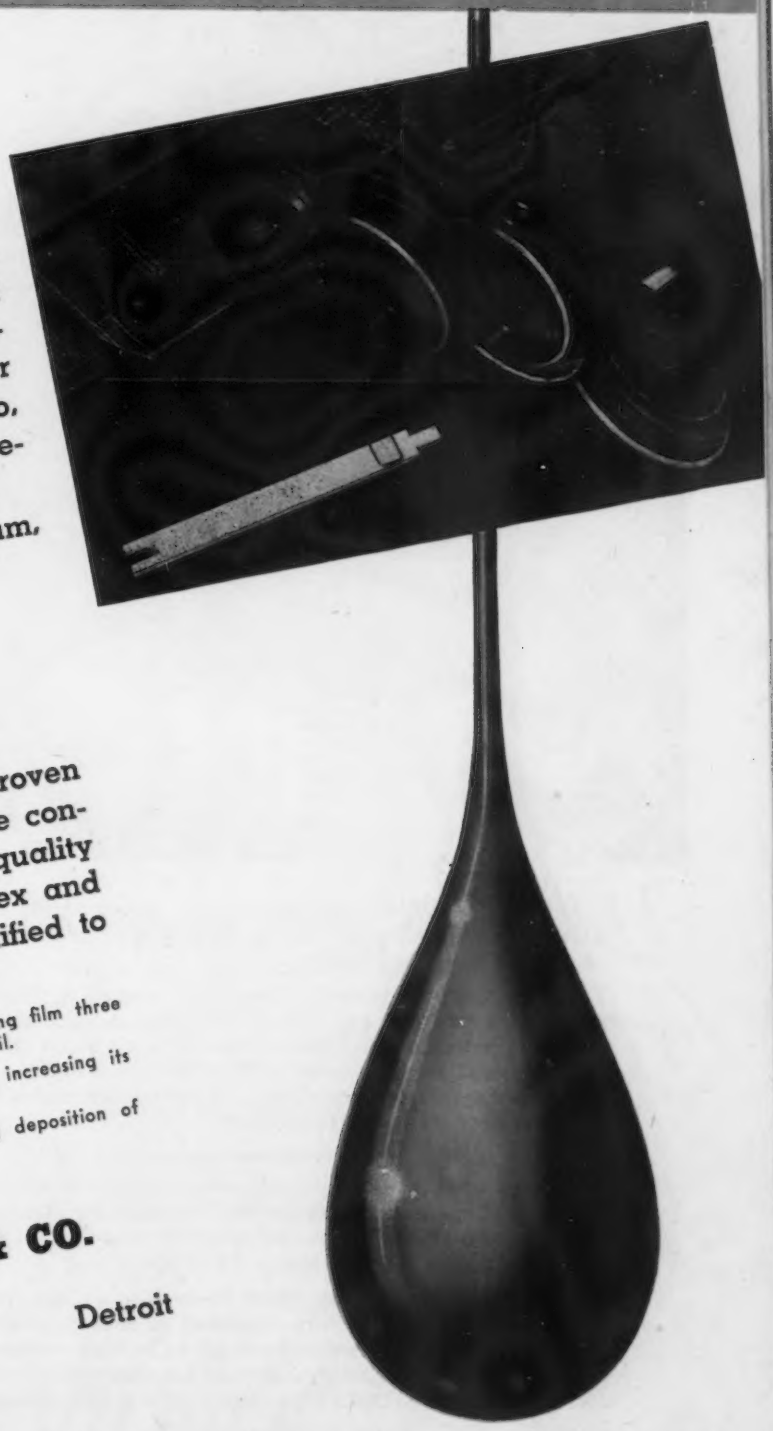
BOILERGIRL: Mrs. Helen Sczubelek, working as a boilermaker's assistant, removes screening from a locomotive boiler at the Pennsylvania Railroad Wilmington car shops.

Wide-World

2 Houghton Products for HYDRAULICS

1 VIM LEATHER PACKINGS

Hydraulic mechanisms require packings which will seal effectively at all times. Huge hydraulic presses exert tons of pressure evenly and gently, with the aid of VIM Leather Packings to seal the hydraulic medium used. You'll find VIM Leather Packings, engineered to the individual job, will do you a better job of longer, trouble-free service. Write for the VIM catalog. And for the correct hydraulic oil medium, use . . .



2 HYDRO-DRIVE HYDRAULIC OILS

A group of treated hydraulic oils, proven to meet today's most drastic service conditions . . . Made of selected best quality oils, possessing high viscosity index and demulsibility rating . . . then fortified to accomplish three aims:

1. To protect moving parts with a tough lubricating film three times stronger than that of untreated hydraulic oil.
2. To improve greatly the oils oxidation stability, increasing its resistance to heat, moisture and agitation.
3. To provide unusual solvent ability, preventing deposition of gum and sludge.

Ask the Houghton Man, or write—

E. F. HOUGHTON & CO.

PHILADELPHIA

Chicago San Francisco Detroit

THE HOUGHTON LINE

OF PRODUCTS FOR THE METAL INDUSTRY

• **American warplanes** can now be sewn together, at speeds as fast as 1800 welding "stitches" a minute, with the aid of electronic tubes much like those in an ordinary radio set, according to Edwin H. Vedder, a Westinghouse Electric & Mfg. Co. engineer. Peak production in airplane plants, he says, depends upon resistance welding, a speedy new process that stitches metal together.

•

• *Watchmakers in industry are finding new usefulness. International Harvester Co. has always employed them for developing technique and training employees. When several of its plants started manufacturing torpedoes to be dropped from planes there developed a number of operations with parts that had to be handled under a magnifying glass in which these watchmakers were found valuable.*

•

• **"Libraries" of copies of vested patents are open at 120 Broadway, New York, and at the Field Building, Chicago. These "libraries" will contain all the patents vested from enemy and other aliens, arranged for ready reference and also catalogued in classified order.**

•

• **Two farm** machinery consultants, Nelson T. Hasenflue and Glenn W. Thompson, have been added to the staff of the Cleveland regional WPB, and they will begin immediately on the task of helping the 86 farm machinery manufacturers in Ohio, Kentucky and western Pennsylvania in meeting the recently enlarged production quotas.

•

• *The 34th annual convention of the American Steel Warehouse Association, Inc., to be held in New York on May 26, will be curtailed to the minimum time necessary to conduct the business of the Association and to discuss plans and regulations affecting the distribution of steel from warehouse stocks. Usual Association program features will be eliminated so the maximum amount of time will be available for guest speakers from the WPB and OPA.*

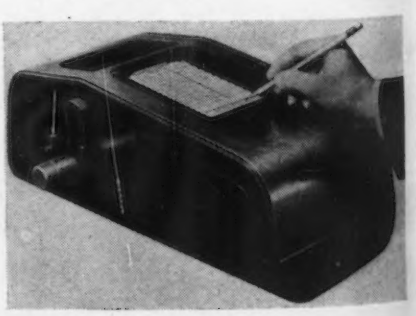
•

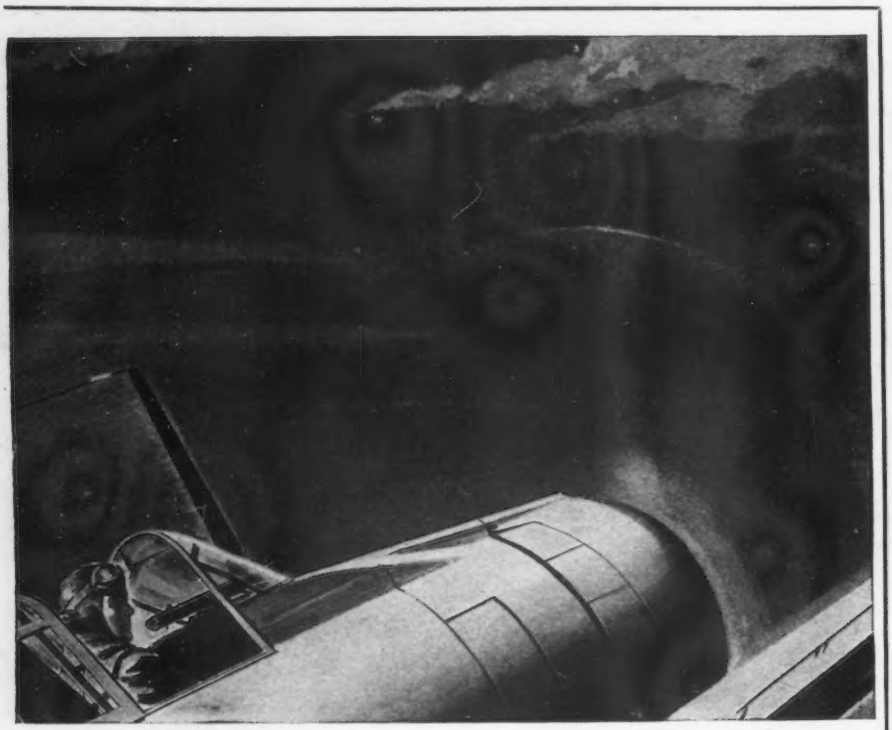
• **Of 1,319,480** employees reported by Class I railways for January, 63,187, or 4.79 per cent, are women and girls.

•

• **Thirteen mobile trailer units, each fitted with portable X-ray equipment that can be set up quickly during battle or air raids, have been purchased in the United States by English donors for the Russian army. The trailers are equipped with X-ray units manufactured by Westinghouse Electric & Mfg. Co. Constructed of sheet metal, each trailer carries complete facilities for fluoroscopy and radiography. To prevent damage, the X-ray apparatus is packed in padded boxes. Power to operate the equipment is supplied by a gasoline engine.**

WOODEN MACHINE: The first business machine made of wood, an autographic register, introduced by the Standard Register Co., Dayton, Ohio, is constructed of laminated plywood and hard wood working parts, weighing about 8 lb., instead of 15 lb. of steel.





Up there alone, hobnobbing with the scudding clouds in the white-flecked azure, what's in the back of his mind, while he scans an ocean monotonously empty?

There are long and glamorless stretches to patrolling. Plenty of time to think—in a detached way that doesn't distract his watchful eyes from sea or instrument panel. Plenty of time to see a sunlit street, a campus path, a breath-catching moment of bashful ardor under a genial moon. Whatever the image, it stands against the background of coming home to opportunity, to work, to fulfillment.

And that's what it will be if production is pushed, if paydays are bond-days and if spare hours are devoted to plans for supplying post-war markets—and thereby a job and home for this boy.

It's his due

There'll be a hunger for the goods we've done without, but they'll not be identical goods. They'll be improved or entirely new. Made, quite probably, with machines that have yet to be built—machines that are typical of American ingenuity—perhaps even like some of those developed and made here at FIDELITY and described in "Facilities."

Write for a copy of this illuminating book.

Designers and Builders of Intricate, Automatic Precision Machines

ARMY (E) NAVY

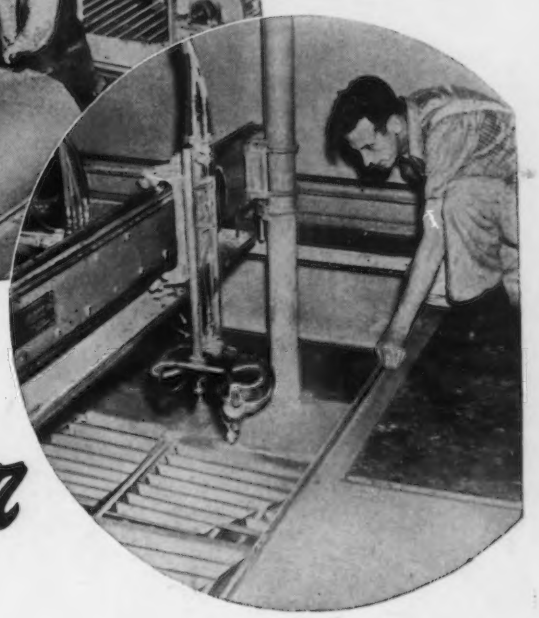
32 YEARS' EXPERIENCE

FIDELITY MACHINE COMPANY

3908-18 FRANKFORD AVENUE, PHILADELPHIA, PA.

Half-way point in the DeVilbiss System. Parts painted on one side are turned and loaded on the second conveyor line for painting the reverse side.

One of the spray stations, showing the horizontal transverse action of the DeVilbiss Automatic Guns.



The "ROBOT" Painter

Automatically coats small plane parts of all sizes and shapes

● Here's how The Glenn L. Martin Company solved their problem of speeding the painting of small parts for Army and Navy bombers. And other war plants can take the tip.

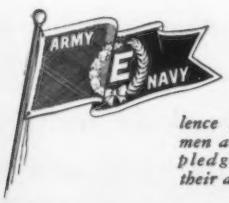
It's a "robot painter" designed by DeVilbiss engineers to automatically coat small bomber parts with an anti-acid paint that resists corrosive elements. All sorts of pieces—from angle bar strips to corrugated sheet sections—are sprayed at one time with amazing speed and thoroughness.

This DeVilbiss Machine is a manpower saver, too. Five men and this "robot" can do in 8 hours what formerly took 15 men to do on three shifts. Because of this, Martin has been able to transfer more than 40 men to other bomber production work where men are urgently needed.

If you are making small war equipment parts and are being pressed for faster deliveries, in spite of the manpower shortage, perhaps DeVilbiss can develop a "robot painter" that will produce similar results for you.

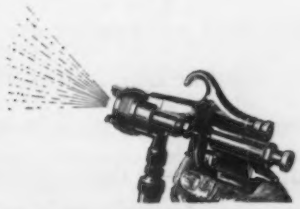
THE DEVILBISS COMPANY • TOLEDO, OHIO

Canadian Plant: WINDSOR, ONTARIO



PROUD to have won the coveted Army-Navy "E" for excellence in war production, the men and women of DeVilbiss pledge to continue giving their all-out best—for Victory.

DEVILBISS SPRAY SYSTEMS



SPRAY EQUIPMENT • EXHAUST SYSTEMS • AIR COMPRESSORS • HOSE & CONNECTIONS

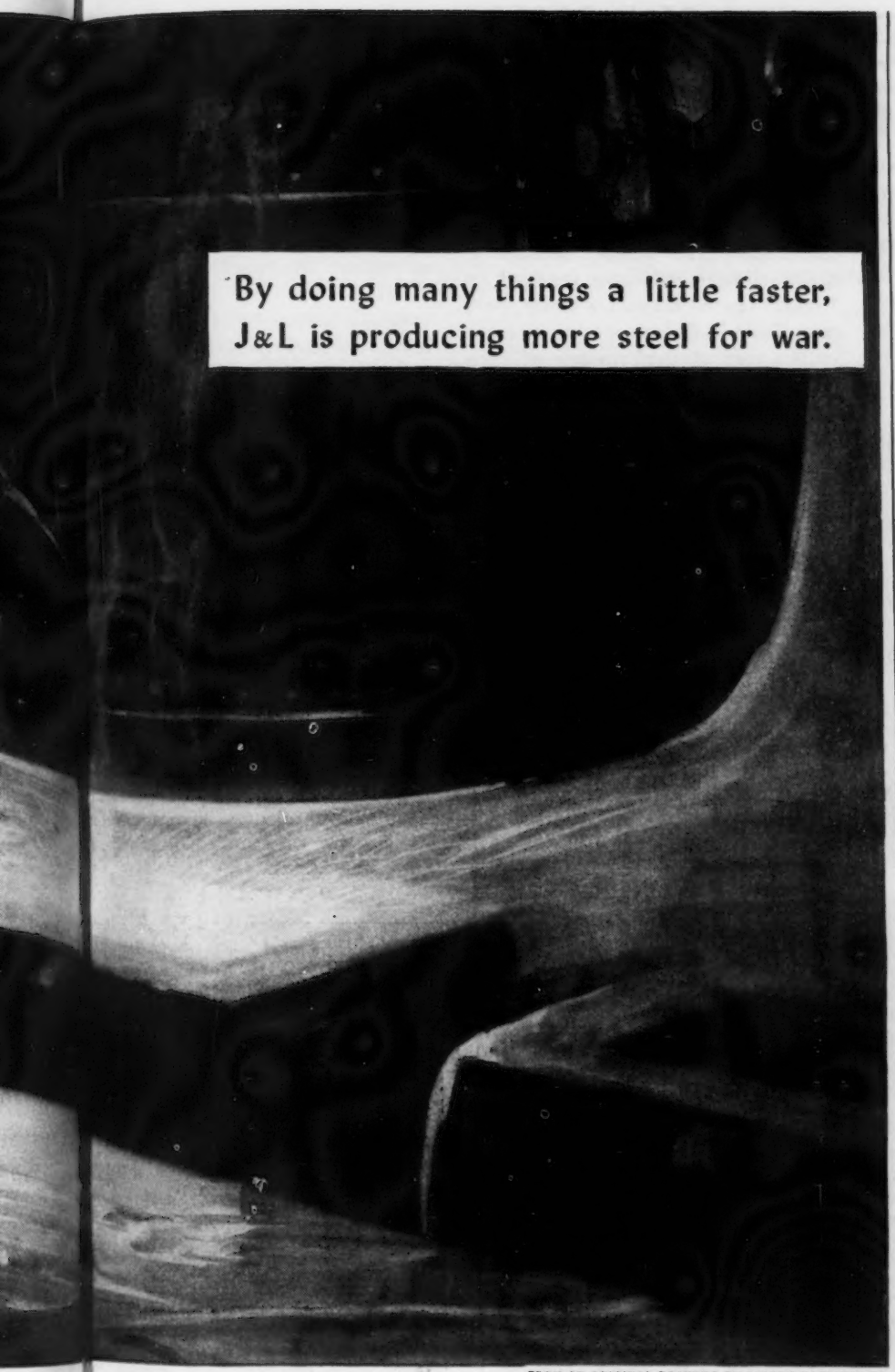
COPYRIGHT 1943—JONES & LAUGHLIN STEEL CORPORATION

TEAMWORK POURING STEEL BACKS UP

America's steel mills today are producing steel for war at the all-time high rate of 95 million tons a year. This averages enough steel in one second's time to make four jeeps — a dozen gun-shields.

In the illustration you see a skilled crew pouring molten steel into man-high molds to become ingots — unit measure of steel production — steel in its first solid form.

The men on the platforms and the cranemen maneuvering the huge ladles from aloft, make up real All-American teams, typical of those all along the steel front of 650,000 workers who are employ-



FROM AN ORIGINAL DRAWING BY ORISON MACPHERSON

OUR FIGHTING MEN

ing all their skill and teamplay to make every second count against the enemy and toward saving American lives on the battle fronts.

JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH, PENNSYLVANIA

CONTROLLED QUALITY STEEL FOR WAR

J&L STEEL

STYLE AND STEEL

Hair-dos to heel heights — Preference for type of dress by women war workers is revealed in survey conducted by *Pittsburgh Sun-Telegraph's* fashion editor Toni Drake. Women working in war plants (including J&L) of three major industries told what they wear on the job and during hours away from work. Most prefer coiffures long enough to be adaptable to many styles. A large percentage prefer dresses to slacks for wear on the job although slacks are required in many instances because of type of work. Low heel shoes and stockings are favored by a large majority. For off-the-job dress 84.6 percent voted high heels; stockings are favored by 98.4 percent. Rayon crepe is the leading selection of fabrics for dresses. Most girls pay between $5 and $10 for date frocks. Many have fur coats. Results of survey also reveal girls in industry know more than average about correct complexion care.

Coquettish War Stamps. A style for the duration, having its nation-wide debut this Spring, is a series of corsages made of war stamps designed by leading American stylists and creators of fashions. The U. S. Treasury Department plans to bring out new designs from time to time and thereby establish a continuing fashion vogue. Corsages for women and boutonnieres for men contain 9 ten-cent stamps, are sold without profit.

Washington's gunsmith for his Virginia regiment, before the Revolution, Scotch John Fraser, whom Washington met on one of his expeditions to the "Forks of the Ohio" (Pittsburgh), attempted to produce iron from native ores as early as 1749.

For record steel plate production in war, thank American motor vehicle industry and other manufacturers of peace-time articles and domestic appliances made of steel sheets. Their demand for long, wide, easily workable sheets of steel led to invention and development in America of modern strip-sheet continuous rolling mills that used to turn out auto-body and refrigerator sheets at the rate of 100 yds. in 10 seconds. As war threatened, these great mills were quickly converted by ingenuity of American steel industry into astonishing producers of war-steel plates for ships, guns, tanks, army trucks, railroad cars, commando barges, light navy fighting craft and countless other priceless war-time applications not otherwise possible to produce without dangerous delay.

20 men in a row, representing a total of 514 years of service at J&L, were seated on stage at the recent presentation ceremonies of the Army-Navy "E" production award to the Aliquippa Works of the Jones & Laughlin Steel Corporation. This row of men was made up of superintendents of the various departments of the works and a veteran employe from each of these departments.

Army, Navy Agree On Contract Policy

Washington

• • • **A joint** Army-Navy policy covering war contracts affected by recent regulations on length of the work week has been agreed upon by the Under Secretaries of War and Navy.

Where, during the course of performance of a lump sum contract or subcontract, a contractor or subcontractor has been required to increase the work week of employees in order to comply with Executive Order No. 9301 and the Regulations of the War Manpower Commission promulgated thereunder; and where, because of premium overtime rates required by Federal law or Executive Order, such compliance has resulted in an increase in the cost of performance of such contract or subcontract, over an above cost of performance had such increase in the work week not been so required; and where such increase in the cost of performance would cause hardship to such contractor or subcontractor, the War Department and Navy Department will give consideration in appropriate cases to granting relief.

Requests by subcontractors must be presented through prime contractors and adjustments, made for the benefit of subcontractors, shall be made only through prime contractors.

A DETROIT ELECTRIC FURNACE SPOILS THE FUN OF THE FOUNDRY GREMLINS

REDUCES METAL LOSSES. The Detroit Furnace was originally developed to conserve the nation's metal and fuel deposits. This is accomplished through fast, efficient melting with lower melting losses and the foundry use of salvage materials.

SAVES LABOR. Fast melting assures a high rate of production per man hour. No fuel to handle or store plus less dross and slag to handle for secondary metal recovery result in lower, indirect labor costs.

SAVES FLOOR SPACE. Compact, fast and efficient Detroit Furnaces give high production per unit of floor space.

REDUCES NUMBER OF REJECTS. Through accurate metallurgical control a Detroit Furnace improves metal quality and results in a higher percentage of finished perfect castings.

SAVES MONEY. Detroit Furnaces save time, labor, materials, floor space and plant equipment. Write today for complete facts.

DETROIT ELECTRIC FURNACE DIVISION

KUHLMAN ELECTRIC COMPANY • BAY CITY MICHIGAN

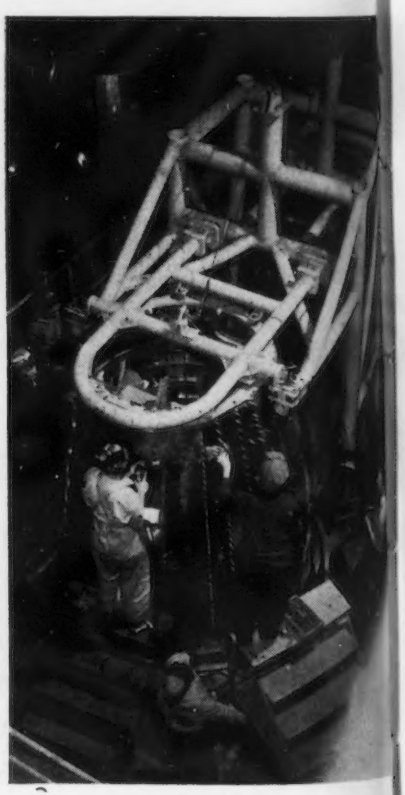
Patent Models of Inventions To Be Auctioned in New York

New York

• • • **An auction of** original United States patent models will take place April 14-29 at the Architectural League, 115 East 40th Street, New York. Items to be auctioned are working models of inventions which were the basis on which patents were issued up to 1880. They represent almost every phase of human endeavor from snap hooks to steam engines. Owners are O. Rundle Gilbert, New York, and associates.

AIRCRAFT NOSE: Nose sections are formed in this special jig at the Boeing Aircraft plant.

Wide-World



"ARMOR PLATE IS APPLE PIE FOR THE POR-OS-WAY WHEEL"

Dear Charlie:
Here I am at the plant. You told me to get the story on Por-os-way. Here it is – and it's a honey. Grinding the edges of armor plate is a tough assignment for any wheel. And these edges are case hardened because they're torch-flame cut. You can see for yourself armor plate is apple pie for the Por-os-way wheel. Por-os-way is way out in front of the previous wheel used.

Your roving reporter
"Vic"

writes POR-OS-WAY'S War Plant reporter

THE RESULTS	POR-OS-WAY WHEEL	FORMER WHEEL
Number of pieces per hour, 4 sides per piece including setting up time	5	2
Wheel dressing required	None	Every 6 or 7 pieces
Life of Wheel	4.5 days (108 hrs.)	½ day (12 hours)
Average depth of cut per pass	.008" to .125"	.006" maximum
Speed of removal for 30" of edge	2 minutes	20 minutes
Number of passes required	7	15
Time per pass	2½ seconds	4 seconds (wheel chipped at faster speeds)
Number of man-machine hours per month, 3 men on 3 machines; 8 hours, 3 shifts, 30 days per month	2160	
Number of pieces finished (4 sides) per month—including setting up time	10800*	4320
Monthly increase in production through use of Por-os-way Wheel	**6480** pieces	2½ times **more** than previously

THE JOB:

Removing average of 1/4" stock from all four edges of 1/2" and 3/4" armor plates, consisting of mild steel one side, hardened steel (600 Brinnell, 35-37 Rockwell) on the other. Torch cutting case hardens the edges. Three Rogers grinders used.

THE WHEEL:

Por-os-way segments — 4 1/8" x 1 1/4" x 4" A24KV2.

All facts and figures given are taken from an actual field survey made by a Por-os-way correspondent.

WRITE *for complete booklet "Facts About Por-os-way". The address is 434 Wheatland St., Phoenixville, Penna.*

*Por-os-way actually removed stock 10 times faster than previous wheel but inclusion of setting up time, being a proportionately large factor, reduces ratio to 5 to 2.

2 TO 5 TIMES MORE WAR PRODUCTION PER MAN PER MACHINE

POR-OS-WAY*
a new RADIAC* PRODUCT

A. P. DE SANNO & SON, INC.
NEW YORK, CHICAGO, PITTSBURGH, CLEVELAND, DETROIT, LOS ANGELES

PHOENIXVILLE, PENNA.
Western Gateway to VALLEY FORGE

*T. M. Reg. U. S. Pat. Off.
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Shipworkers Indicted on Labor Charges

Jersey City, N. J.

• • • **The Hudson County** Grand Jury, in session here, indicted seven minor supervisory employees of United States Steel Corp.'s Federal Shipbuilding & Drydock plant at Kearny, N. J., this week, charging them with planting over 200 unskilled workers in the company's machine shop by means of false affidavits. Other charges included charging fees for so placing workers and deliberate actions to attain draft deferment for the men in addition to filling skilled jobs with unskilled help.

Lynn H. Korndorff, Federal Shipbuilding's president has issued a statement saying that all employees named in the charges will be suspended pending court action which will prove their innocence or guilt.

The company first knew of such activities shortly after the yard had been returned to them by the Navy in January 1942. First arrests were made in July of 1942 through action of the New Jersey State Department of Labor, according to Korndorff.

A BETTER DOOR
either way you look at it!

As you can see from this "two-side" illustration of the Kinnear Wood Rolling Door you can get the efficiency, space-saving *coiling upward* action of Kinnear Steel Rolling Doors in spite of wartime contingencies. And at the same time you'll have durability and protection that has been thoroughly proved on numerous installations for many years!

The interlocking slat curtain of the Wood Rolling Door is assembled for strength, weather protection and smooth coiling operation. Spring counterbalanced and storing itself compactly above the opening, it affords the maximum economy of manpower and space — as well as war vital materials! It is built in any size, manual or motor operated, and suited to old or new installations. Write today for complete details. THE KINNEAR MANUFACTURING COMPANY, 1760-80 Fields Ave., Columbus, Ohio.

A SAVING WAY FOR DOORWAYS

KINNEAR ROLLING DOORS

Rolling Mill Committee To Meet in Pittsburgh, May 10

Pittsburgh

• • • **The first meeting of** the newly organized Rolling Mill Committee of the Association of Iron and Steel Engineers will be held on Monday, May 10, at the William Penn Hotel, here, with a program devoted to blooming and slabbing mills. Technical papers will be presented at two sessions, starting at 1:30 and 8:00 p.m. A dinner will be served at 6:30 p.m. The program is as follows:

(1) "A New Soaking Pit Design," by Joseph Sparks, Swindell-Dressler Corp., Pittsburgh; (2) "Main Roll Drives for Blooming and Slabbing Mills," by Ralph Wright, Westinghouse Electric & Mfg. Co., East Pittsburgh; (3) "Design of Blooming Mill Elements," by H. H. Talbot, United Engineering & Foundry Co., Pittsburgh; (4) "Scheduling the Primary Mills," by Alex Montgomery, Jr., and J. B. Holbrook, Carnegie-Illinois Steel Corp., Duquesne; (5) "Prevention of Flaking in Hot Worked Sections," by O. A. Bamberger, Republic Steel Corp., Massillon.

Newhall Heads CPRB; Batt Named to New Chair

Washington

• • • **Arthur Newhall** has been appointed executive director of the WPB Combined Production and Resources Board to supervise and control the work of the Board's combined staff and to exercise general direction over the work of various committees.

At the same time, WPB Vice Chairman Charles E. Wilson who is Donald Nelson's deputy on the CPRB, announced that William L. Batt, who will represent Mr. Wilson on the CPRB, will also sit with the WPB Production Executive Committee, the group through which the American procurement agencies and WPB make a joint attack on American production problems.

Machine Tool Stock Sold

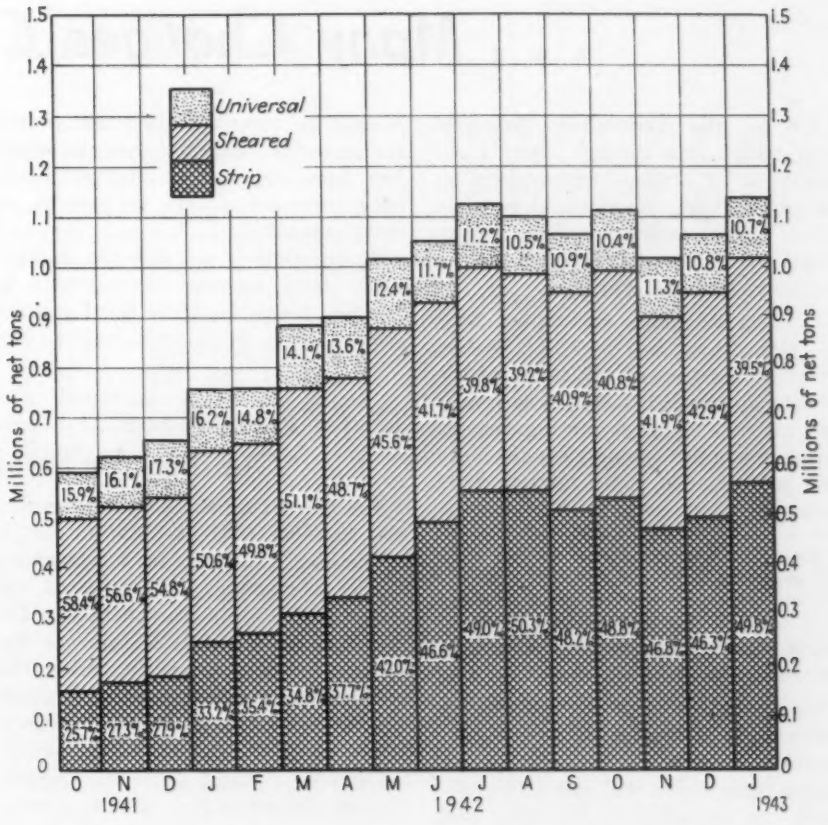
• • • **The entire holdings** in International Machine Tool Corp., of Eugene H. Welker and his family, Detroit, amounting to 34,650 shares of common stock, have been acquired by Strong, Carlisle & Hammond Co.

Strip Mill Plate Responsible for Half of Ship Program

• • • **The enormous** dependence of war shipping on the continuous strip mill is shown graphically for the first time in the accompanying WPB chart. By the first of this year, the chart indicates, plates from strip mills were responsible for half the ship and tanker program, and amounted to 565,893 net tons a month, in contrast with a pre-Pearl Harbor output of plate from strip mills amounting to 152,440 tons.

WPB figures on where plates are coming from show:

1941	Universal	Sheared	Strip	Total
Oct. ...	94,311	346,401	152,440	593,152
Nov. ...	99,828	350,838	169,311	620,007
Dec. ...	113,467	358,273	182,604	654,344
1942				
Jan. ...	122,227	381,899	250,396	754,522
Feb. ...	111,965	377,770	268,988	758,723
Mar. ...	123,152	449,379	306,195	878,726
Apr. ...	121,838	436,614	337,519	895,971
May ...	125,608	461,375	425,211	1,012,194
June ..	123,114	438,144	489,704	1,050,962
July ...	126,100	447,481	550,537	1,124,118
Aug. ..	115,710	340,197	551,959	1,097,866
Sept. ..	115,372	434,555	511,909	1,061,836
Oct. ...	114,506	449,895	536,981	1,101,582
Nov. ...	114,755	424,708	474,136	1,013,599
Dec. ...	114,650	454,902	490,487	1,060,039
1943				
Jan. ...	121,039	448,481	565,893	1,135,413



Previously, the more profitable items sold by producers, including cold reduced sheets for deep drawing, tin and terne plate, cold reduced strip, and commodity cold rolled strip, came from the continuous strip mill. With a much higher proportion of plate coming off mills now, this has been partly responsible for a sizable drop in the average weighted selling price of steel products, which many mills have suffered.

This drop in average weighted selling price has been offset considerably by capacity production in all steel mills and by expansion in production of high priced alloy steels. Also, plates being heavier than the sheet and strip formerly produced, sales on a tonnage basis are much higher. In addition, finishing costs are eliminated. The general belief is that direct financial returns from plate production on continuous strip mills just about equal those for production of the pre-war items.

However, this question of the financial effect of the switch to plate production involves also such complications as the depreciation on unused finishing mills, and the cost, in some cases, of additional cooling tables and other production modifications for plate making. Just where this puts financial gains or losses of the mills is, at least at present, lost in a maze of bookkeeping.

Guffey's Secretary Denies Remark

• • • **Richard H. Bailey, Jr.**, secretary to Senator Joseph F. Guffy of Pennsylvania, in a statement released through the Associated Press on April 1, called "grossly incorrect" the statements attributed to him in the March 25 issue of this magazine in a story on unemployment in Scranton.

Mr. Bailey, in his April 1 statement, said: "The statement attributed to me in the March 25 issue of THE IRON AGE is grossly incorrect. In effect, all I said to the representative of THE IRON AGE when she called me on the phone was that while the Anthracite Commission in its report had recommended the placing of war material plants in the Scranton area, we had not been successful as yet in having the recommendations carried out. I pointed out that we had been successful in having one comparatively small piston ring plant established there.

"Everything printed in the article which is in excess of the statement printed above is gross misstatement."

Mr. Bailey's denial was issued after Congressman John W. Murphy, also a Democrat, in a statement also circulated by Associated Press, expressed astonishment at Mr. Bailey's remarks, as reported in THE IRON AGE. In its quotation of Mr. Bailey, THE IRON AGE used a shorthand report. Mr. Bailey's remarks were taken down word for word.

Tool Shipments Drop

Washington

• • • **Figures on the number and value of machine tools shipped during February were released by WPB on Tuesday and showed a reduction of nearly 3 per cent from the previous month shipments. Approximately 35,500 tools were shipped having a value of $114,372,000. The backlog of orders shows a 7.9 per cent drop in value from the January figure. The average time required to complete unfilled orders was 6.5 months at the end of February as against 6.8 months at the end of January.**

. . . Many Changes Clarify Controlled

• • • **As the Controlled Materials** Plan moved into its own April 1, an avalanche of actions, preparatory to meeting as many problems as possible before they become serious, were taken by WPB and individually by Industry Division directors.

Policing to assure compliance with the plan which had been a brewing worry in the face of hesitancy to try to enlarge the WPB staff was ironed out recently through an agreement with other governmental departments who will provide some 1200 to 1500 "policemen." These men will form the

More CMP news appears on pages 94, 118 and 140.

long arm of the Compliance Division which will attempt to keep some 10,000 controlled material users in line.

While the facts are not yet known, Washington is expected to issue a number of new revisions to CMP Regulations which will aim at simplifying the operation of the plan and cut paperwork.

Direction No. 1 to CMP Regulation No. 1, which caused such a furor in the steel industry, has been clarified this week by Harold Boeschenstein to mean simply a freezing of mill schedules as of March 22 with a supposed clear definition between the precedence value of rated orders and allotted orders. In effect it is seen as a declaration of a moratorium on CMP orders until April 15.

Charles E. Wilson is believed to have found the scheduling of critical components to be a considerable headache and is reported to have notified all manufacturers of Class B products to reject all orders which their facilities will not permit them to complete by the scheduled delivery dates. Other controlled materials users have experienced trouble in placing mill orders because mill schedules do not always have the capacity at which they are rated by the Requirements Committee for the specific sizes ordered. WPB has postponed from April 1 to May 1 the effective date of its order placing production of critical components under strict scheduling.

Steel producers have been instructed this week in regard to obtaining materials they need in the production of controlled materials and have been notified that grinding rods henceforth shall be classed as hot rolled bars and as such become Class B products. Steel mills were also told that orders for material, replacing material which has been rejected on delivery, will take precedence over all orders on their schedules.

Manufacturers of common components have received instructions to file new forms for their third quarter requirements which will disclose the source of their orders.

Warehouse and distributors of steel products have been the target of a number of recent orders and regulations designed to bring them more completely under the jurisdiction of CMP. The definition of dealer has also been clarified to eliminate the fabricator.

• • •

Order Precedence Clarified for Steel

• • • **The WPB has clarified** Direction No. 1, under CMP Regulation No. 1, to indicate that it was not intended to be retroactive. "Purpose of the Direction," Harold Boeschenstein, Director of the Controlled Materials Division explained, "was to freeze the mill situation with respect to production schedules as of March 22, 1943. However, due to the use of the phrase 'on or before March 22' in the original text of Direction No. 1, some confusion was caused in steel mills."

This confusion was due to the belief of some mill operators that the Direction required reinstatement of orders which had been displaced in mill production schedules before March 22 by other orders bearing allotment numbers.

Under the amendment of the Direction, it is made clear that orders which were displaced in mill production schedules prior to March 22 need not be reinstated.

DRAFT DEFERMENT: G. Howland Shaw, testifying before a House Military Affairs Subcommittee, stated that it would be impossible to replace 261 Army age State Department foreign service officers because of their specialized training.

•

CMP Explained for Construction Under $10,000

• • • **A simple plan** for the allotment of controlled materials under CMP for certain types of construction costing less than $10,000 has been announced by WPB.

No application to a Claimant Agency for allotment of controlled materials is necessary for construction of this type. Under the procedure now set up, a simplified PD-200-c form applicable to these cases will be used. Regional Offices make allotment of controlled materials and assign preference ratings on CMP-L-127 forms. In the case of non-war housing costing less than $10,000, the applicant must file PD-105 and PD-105A forms with the nearest Federal Housing Administration field office.

•

Plate Reports Revised

• • • **Instructions to producers** of steel plate in making reports under CMP have been revised in part. The previous instructions have been modified in so far as they call for reports on "in schedule" and "out schedule" tonnages. The instructions were contained in a circular letter signed by H. G. Batcheller, director of the WPB Steel Division, which said, in part:

"List 'in schedule' on Form PD-169, orders which in total tonnage will equal the amount of your Production Directive. Utilize the 'out schedule' columns to list orders that you have accepted in excess of your Production Directive tonnage. This list should not exceed 10 per cent of your Production Directive tonnage."

Materials Plan Before Deadline . . .

Replacement Orders Must Get Preference

• • • **A replacement order** for steel that has been rejected by a producer's customer because of its failure to meet specifications shall be filled in preference to all other orders, regardless of whether such other orders are authorized Controlled Material orders or orders bearing higher preference ratings, in the absence of specific instructions to the contrary, WPB has ruled in a letter addressed to steel producers.

A producer of steel whose material has been so rejected by a customer may replace that portion of material which has been rejected without the extension of an additional allotment, and shall give such tonnage preference in his production schedule under the ruling.

•

3 Industries Exempted From CMP-2 Inventory Limits

• • • **Mining and utilities** producers and petroleum operators have been exempted from the inventory provisions of CMP Regulation No. 2. As a result, these operations revert to limitations imposed in P-98-c, P-56, and U-1, respectively.

In the instance of mining producers, the CMP Inventory Direction is merely a conforming action, inasmuch as provisions of P-56, as amended March 17, maintain its inventory provisions in effect, despite CMP Regulation No. 2. In this case, no producer may receive any delivery of material increasing his inventory above the minimum necessary to sustain his current level of operations. The ratio of such inventory to current production must not exceed the ratio of average inventory to average production for 1938, 1939 and 1940. The conforming action is taken in Direction No. 4.

•

Structural Products Classed As A Products under CMP

• • • **Structural steel** and reinforcing bars are to be classified as Class A products, whereas other steel building products not fabricated to specification are to be considered Class B products, S. L. Wirgman, chief of CMP metal building materials section, and J. L. Haynes, director of the building materials division of WPB Construction and Utilities Bureau, said last week in a circular letter explaining the basis on which allotments for the second quarter of 1943 were made.

Allotments for fabricated structural steel, such as beams, girders, columns and trusses which are fabricated after an order has been received, and fabricated reinforcing steel, such as reinforcing bars cut and bent to specifications, should be obtained from customers except that an allotment for manufacture of Class A products sold for use as repair, maintenance and operating supplies may be obtained on a CMP-4B application filed with the division.

For applications covering both Class A and Class B products, part of each allotment is for manufacture of Class B products and part is for fabrication of Class A products to be sold for use as repair, maintenance and operating supplies. Parts of orders calling for delivery of controlled materials in excess of the total allotment must be cancelled.

Recent CMP Revisions and Directions

Allotment numbers identifying allotments for the third quarter of 1943 and for subsequent quarters for the production of Class B products have been revised to provide a more accurate identification of the source of purchase orders. (CMPL-154)

•

Procedure to follow with respect to replacement orders in cases where steel delivered to a customer is rejected has been outlined to steel producers. (CMPL-119)

•

All laboratory equipment has been consolidated into one class in the list of Class B articles. (CMPL-156)

•

Grinding rods are a controlled material and not a Class B product. (CMPL-146)

•

Steel producers have been notified that the Steel Division will process all applications made for controlled materials they require to produce a controlled material. (CMPL-153)

•

Structural steel and reinforcing bars are to be classified Class A products, and other steel building products not fabricated to specification are to be considered Class B products. (CMPL-158)

•

Manufacturers of cans have been informed that they must make application for controlled materials divided between their various outputs. (CMPL-164)

•

Culvert and sewer reinforced concrete pipe and precast reinforced concrete products will be considered Class B products under CMP beginning with the third quarter. (CMPL-161)

•

Repair parts for office machinery and equipment may be obtained through the use of preference ratings assigned by CMP Regulation No. 5. (WPB-3054)

•

Up-rating of an order by the application of an allotment number relates back, for the purpose of determining the sequence of delivery, to the date on which the original rating was applied to the order, according to an interpretation of CMP Regulation No. 3. (WPB-3060)

•

Industrial equipment manufacturers will be required to give an extended classification of B products they require under CMP.

▪ ▪ ▪

For copies of above announcements address Office of War Information, Washington, giving announcement number as shown in parentheses after each paragraph.

Warehouses Given Stock Replacement, Earmarking Plan by New WPB Orders

Washington

• • • **WPB established new** procedures governing the delivery of merchant trade products to distributors last Thursday with the issuance of Order M-21-b-2. Order M-21-b, which has been split into M-21-b-1, M-21-b-2 and CMP Regulation No. 4, was revoked.

The order permits a warehouse to place orders for certain merchant trade products up to the percentage of mill production set aside for warehouses under Steel Division Production Directives. Warehouses, however, must place their orders for such products only with producers with whom they have a base tonnage. Such orders are considered authorized controlled material orders. In addition, a warehouse may replace in stock, without limit as to quantity, merchant trade products of the same type it sold on authorized controlled material orders during the preceding 90 days or on orders rated AA-5 or higher. Orders of this sort accompanied by Form CMP-11 can be placed with any producer and are considered authorized controlled material orders.

For a separate group of merchant trade products such as wire fence, bale ties and other products widely used by farmers, a different procedure is to be followed. Warehouses can obtain these products directly from their regular supplying producers up to a specified percentage of their base tonnage, but these orders are not considered authorized controlled material orders. Mills are required to fill such orders only after all authorized controlled material orders for the same products group in the same month have been filled.

Latest CMP news sections start on pages 94, 118 and 140.

A warehouse, however, can obtain earlier deliveries on such orders by giving them the status of authorized controlled material orders. This is done by filing with the producer a copy of Form CMP-11, indicating the tonnage delivered during the preceding 90 days on orders bearing allotment number or on orders rated AA-5 or higher. Dealers will operate entirely on a stock replacement basis and can shift freely among the various merchant trade products. The procedure under which dealers make their purchases has been made as simple as possible. The order contains other provisions relating to the earmarking of warehouse stocks.

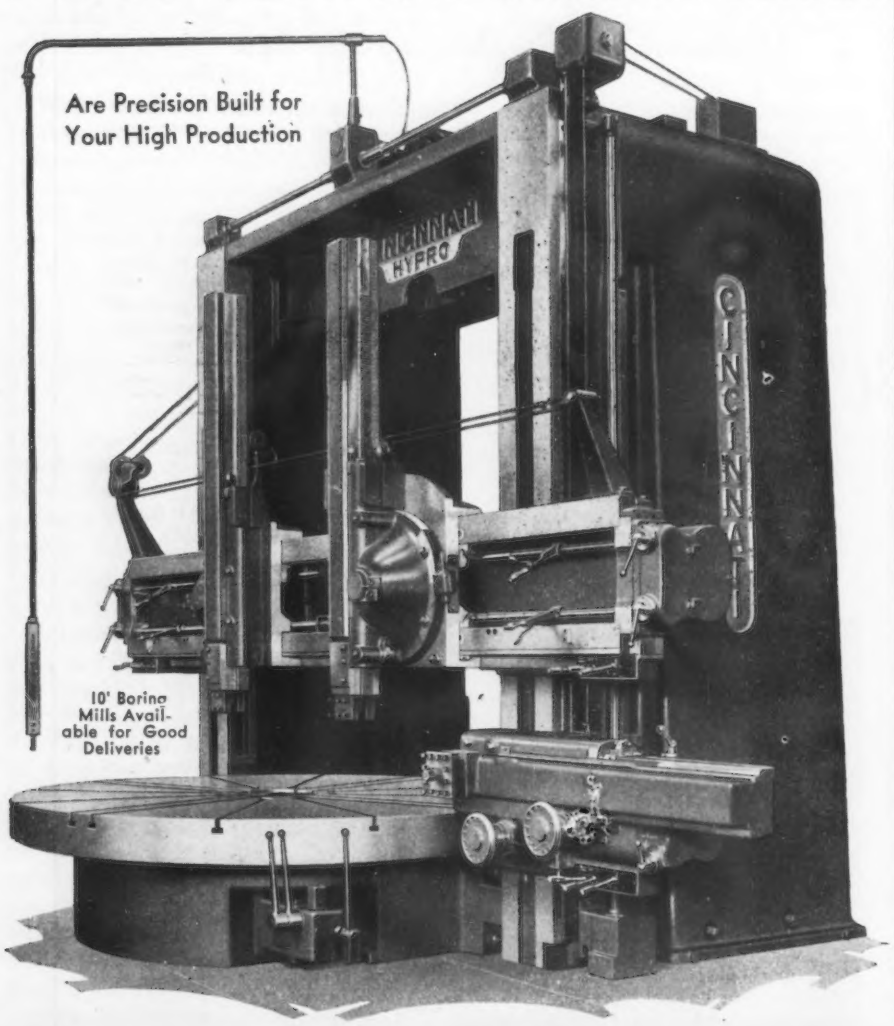
•

M-21 Amended to End Confusion With CMP

Washington

• • • **To eliminate possible** confusion resulting from the operation of CMP, certain formal changes in Order M-21, governing deliveries of iron and steel products, were made April 1 by WPB. The order as amended makes it clear that deliveries can be made on authorized controlled material orders, and that deliveries by distributors

Cincinnati
HYPRO VERTICAL BORING MILLS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can be made in accordance with CMP Regulation No. 4.

Another change provides for the reporting of shipments wherever possible by CMP allotment numbers or symbols, in lieu of the group classifications formerly used. The definitions of iron and steel products are also changed slightly so that they conform more closely with the CMP definitions.

•

Electric Bulbs Threatened By Tungsten Wire Shortage

Washington

• • • **The incandescent bulb** shortage described in THE IRON AGE of April 1, page 84, now appears more serious than was first reported. Distributers' stocks are now down at least 20 per cent with tungsten wire shortage, due to a lack of machine capacity, being augmented by a diminished supply of tungsten cathodes used in fluorescent lamps.

Trade sources say that bulb supply cannot be increased because tungsten itself is short for this purpose. Meanwhile, WPB took cognizance of the situation last week. Last Wednesday by an amendment to Order L-28 civilian bulk use was restricted so that no civilian order can be filled until military, export and industrial orders bearing a rating of AA-5 or higher have been filled.

The next day bulb manufacturers were told that they could apply to WPB for authorization to use tungsten and other materials for the production of lamps which were previously prohibited by Order L-28. The WPB Consumers Durable Goods Division estimated that 16,000,000 bulbs will be made available for general consumption in April, in addition to those produced for industrial, military and export users.

•

Component Order Revised

Washington

• • • **General Scheduling** Order M-293, issued Feb. 27, providing specific regulations to cover the manufacture and distribution of critical components, has been amended by WPB. The change sets forward to May 1, from April 1, the date after which deliveries of items on the Class X list may be made only according to schedules filed with WPB, and Class Y items may be delivered only when authorized. Experience with the order showed that it was not practicable to adhere to the original order.

WPB Delineates Operation of E-5-a Precision Tool Order

Washington

• • • **WPB has issued** General Preference Order E-5-a which controls the distribution of new gages and precision measuring hand tools. The term takes in micrometers, verniers, calipers, rules and similar precision tools and also includes gage blocks, external and internal thread gages, round internal and external gages, and other like measuring devices.

The order assigns a preference rating to individual employees with which to obtain precision tools required for their employment. The preference rating assigned is the same rating as the employee's employer is assigned for maintenance, repair and

WHERE 10 DAYS HAD BEEN TOPS...

these Spouts lasted 30!

THAT IS because these pulverizing mill discharge spouts have a hard-facing of Coast Metals. This protecting overlay is exceptionally resistant to the severe abrasive action of the hot clinker mixture that formerly wore out ordinary spouts in less than 10 days' service!

Easily applied by the electric welding arc or the oxy-acetylene torch to any ferrous metal including manganese steel, cast iron and chilled iron, Coast Metals hard-facing is today's wartime answer to making parts employed in tough service last longer. By keeping equipment on the job without unnecessary shutdowns for repair or replacement, it steps up production and improves plant operating efficiency.

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Plant and General Offices: Canton, Ohio
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COAST METALS
hard-facing weld rods

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operating supplies by CMP Regulation No. 5 or 5A.

Sales by producers or distributors of new gages or precision measuring hand tools are restricted to (1) approved users, (2) other distributors, and (3) approved employees. Each of these terms is carefully defined, and producers and distributors should familiarize themselves with classes of customers falling within these groups.

Sales to Approved Users and Other Distributors. After May 1, sales and deliveries to approved users and to distributors are permitted only if the purchase order bears a preference rating of A-9 or higher, *and* the purchase order is accompanied by a prescribed statement *in addition to* any other certification required in applying or extending the rating of A-9 or higher:

Sales to Approved Employees. After May 1, sales and deliveries to approved employees are permitted only if the purchase bears a preference rating of AA-2X or higher *and* the purchase is accompanied by a certification by the approved employee and an authorized official of his employer.

Note that *only one precision tool may be placed on each joint employer-employee statement.* Thus, an employee required to have three precision tools for his job must be supplied with three separate slips. The preference rating assigned to approved employees is effective at once and may be used by approved employees requiring tools in their employment. The other specific restrictions imposed by the order are effective May 1. General Preference Order E-5 which heretofore controlled these items is revoked as of that date.

M-21 Revised to Adjust for CMP

• • • To eliminate possible confusion resulting from the operation of the Controlled Materials Plan, certain formal changes in Order M-21, governing deliveries of iron and steel products, were made last week by WPB.

The order as amended makes it clear that deliveries can be made on authorized controlled material orders, and that deliveries by distributors can be made in accordance with CMP Regulation No. 4. Another change provides for the reporting of shipments wherever possible by CMP allotment numbers or symbols, in lieu of the group classifications formerly used. The definitions of iron and steel products are also changed slightly so that they conform more closely with the CMP definitions.

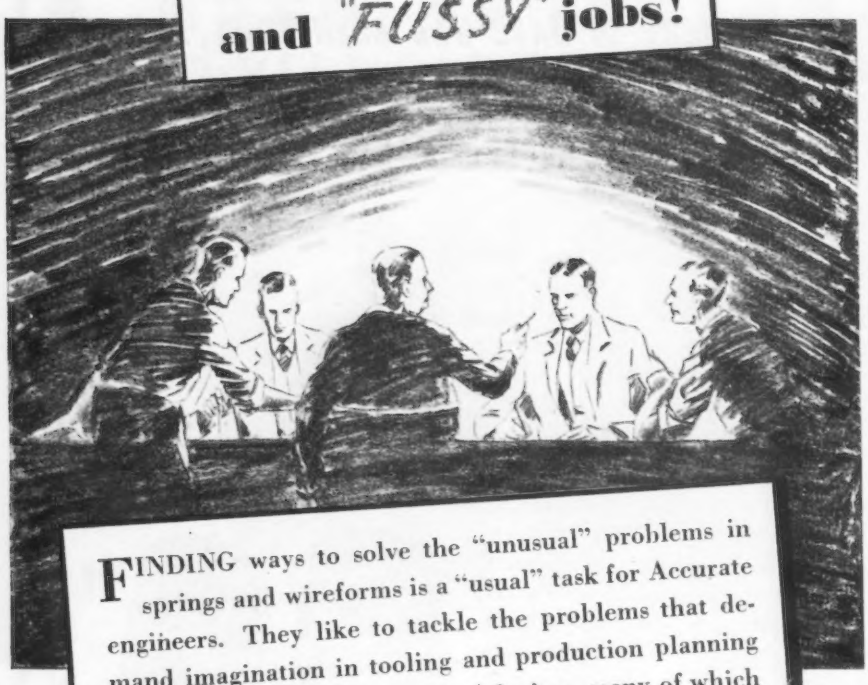
Calcium Metal Allocated

Washington

• • • Calcium metal was placed under allocation last week by WPB through issuance of General Preference Order M-303. Anyone seeking authorization to use or accept delivery of calcium metal in any month beginning with May, 1943, whether for his own consumption or resale, must file application with WPB and his supplier on Form PD-600 by the 15th of the preceding month.

A producer or distributor seeking authorization to make delivery of calcium metal must file application with WPB on Form PD-601 by the 20th of the month preceding that in which delivery is planned.

We like the "TOUGH" and "FUSSY" jobs!



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Interpretation Given Warehousemen on Amended M-21-b-1

Cleveland

• • • **An interpretation** of the revised M-21-b order effective April 1, was given this week by the regional manager of the Redistribution Division of WPB. The amended order, now M-21-b-1, applying to steel warehouses, permits the purchase by such warehouses without limitation as to quantity steels from idle or excess inventories.

In making such purchases, care must be taken to see that no material is purchased by or sold to a warehouse that does not have a quota on such items. If a steel warehouse has been certified under PD-83-b to purchase a specific item, then the sale to that warehouse of that item is not limited. If, however, a steel warehouse is not certified to stock a given item under present regulations, the purchase of such an item from idle stocks is forbidden. The amount of the warehouse quota is of no consequence, since there is no limitation as to quantity.

Under Priority Regulation No. 13, a warehouse could buy idle or excess steel provided orders rated AA-5 or better were collected on form PD-83-g and the ratings were extended for such materials or if purchases were made on a warehouse rating of A-1-k by authority granted by the Steel Warehouse Section, Steel Division, Steel Recovery Corp.

Paragraph "d" of the new order eliminates the need for ratings. However, the seller of the materials must advise G. L. Link, Steel Recovery Corp., Pittsburgh, by telegram of all sales to warehouses and have authority issued to the buyer to make such purchases. The purchaser must submit the seller two copies of each purchase order, showing complete specifications on materials to be purchased. One copy will be kept by the seller and the other, attached to a copy of the seller's telegram to G. L. Link, Steel Recovery Corp., should be mailed to Mr. Link so that complete data on the transaction will be available.

•

Rubber Machinery Controlled

Washington

• • • **The Office of Rubber** Director has taken control of all rights to acquire, manufacture, deliver, recondition and rebuild rubber processing machines and equipment. These rights were conferred with the issuance of Order L-143-a under which all manufacturers and dealers in rubber processing machinery and equipment are required to file lists of unfilled orders on their books as of March 26 and obtain WPB authorization before deliveries can be made. No such machinery may be produced without authorization after April 9.

Standardization Ordered In Refrigeration Equipment

Washington

• • • **Increased conservation** of materials used in commercial and industrial refrigeration and air conditioning equipment still being produced for necessary purposes is effected by Order L-126 as amended by WPB.

The order provides for the standard-

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At his desk in guard headquarters, one man, with the aid of modern Automatic Alarms, may keep miles of industrial fence lines under constant surveillance . . . captain of a great army of tiny robot sentries, or detectors, which report any attempt to cross over, under or cut through such barriers and locate the actual zone of disturbance. Operating on a principle of sound detection, Automatic Alarm Systems provide infallible, round-the-clock protection, uninterrupted even during periods of blackout, storm and fog when the hazards of sabotage, espionage and theft are greatest. Used in conjunction with any type of fence, Automatic Alarms are relatively low in cost, easy to install and require little or no servicing. Here is protection at its best. Use it.

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This 11 in. bore x 66 in. stroke Hannifin hydraulic cylinder was built for tilting an electric furnace. The strong, simple, no-tie-rod design and Hannifin precision construction insure simple application, and high efficiency operation with maximum usable power. Even in this large size the cylinder bore is honed to produce a mirror finish, straight, round and concentric. Efficient piston seal assures minimum fluid slip.

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HYDRAULIC CYLINDERS

ization of products, simplification of designs and of manufacturing practices, and for the conservation and substitution of materials.

•

PRP Units May Use First Quarter Ratings Again

Washington

• • • **By an amendment** of Priorities Regulation No. 11A, issued last Thursday by WPB, PRP units which do not process the materials listed in Regulation No. 11, but purchase only fabricated items or materials other than those listed, may now apply, during the calendar quarter beginning April 1, the ratings they were authorized to use by their first quarter PD-25A and PD-25F certificates to the same quantities of fabricated items and unlisted materials.

Previously, Regulation No. 11A limited use of first-quarter ratings by a PRP unit during the second quarter to the amount of unlisted materials and of fabricated items needed to balance the listed materials it was authorized to receive. Thus, until the change, assembly plants and other companies which previously operated as PRP units, but did not require listed materials in their output, had no general procedure for obtaining the needed production materials during the second quarter of 1943.

•

60-Inch Poultry Net Permitted

• • • **Permission to manufacture** a wide style of poultry netting, not previously permitted by Limitation Order L-211, is contained in Schedule III to the order as amended last week by WPB.

The schedule permitted the manufacture of only two styles of poultry netting, one 48 in. in width and the other 12 in. in width. The third style, permitted by the amended schedule, is 60 in. in width—a style in demand for agricultural purposes in the South.

•

Metal Lath Eased

• • • **Restrictions on** the manufacture of metal plastering bases were eased by WPB last Friday. The production relaxation became effective through issuance of Limitation Order L-59-b as amended. Manufacture of such bases and metal plastering accessories for civilian use in plastering still is prohibited, the relaxation permitting only the use of the bases in connection with metal reinforced insulation

blankets and pipe covering, metal reinforced filters and oil reduction equipment.

Included in the order's provisions is one permitting the sale of metal plastering bases or metal plastering accessories in the possession of any person prior to Apr. 2. In this way, a frozen inventory of material which cannot be used in the war effort will be freed for civilian plastering uses.

•

Canada Limits Grinding Balls

Toronto

• • • **Grinding balls** are now obtainable in Canada only by permit from the Steel Controller, under a new order S.C. 24, issued over the signature of M. A. Hoey, Associate Steel Controller. Order S.C. 24 says: "Except under a permit in writing from the Steel Controller, no person shall purchase or acquire, sell or supply any grinding balls."

•

43 Reports Abolished by Amended Priority Reg. 8

Washington

• • • **Priorities Regulation No. 8** which was the first step in a move to eliminate unnecessary or duplicating reports, was further amended by WPB on Monday to eliminate requirements for reports on any of the 43 forms listed in Appendix A to that regulation. Previously, many uses of these forms had been eliminated, but until Monday, users had to report on the listed forms, under the existing P orders.

•

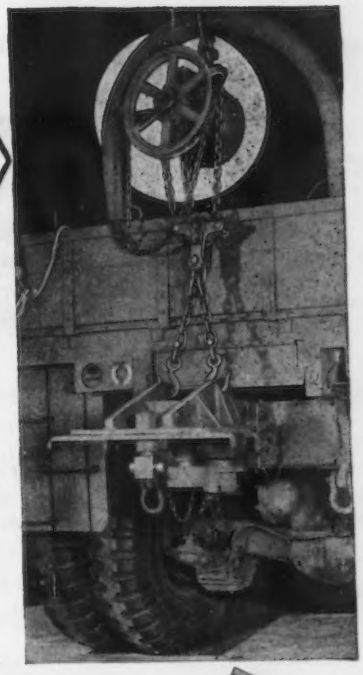
Steel Use Limited In Conveyor Machinery

Washington

• • • **Restrictions on** the use of steel in continuous stream conduit elevator-conveyors were imposed on Monday by WPB with the issuance of Amendment No. 1 to Schedule A of Order L-193 as amended. The order covers conveying machinery and mechanical power transmission equipment and includes Schedule A, which sets forth restrictions and limitations on the use of steel and other critical materials. The amendment adds continuous stream conduit elevator-conveyor casings to Schedule A.

The following parts of the elevator-conveyors are exempted from the prohibition on the use of steel imposed

The Hoist That Can "Take" Real *Punishment*



● Out on the battle fronts, as well as along production lines, Reading Chain Hoists are staying on the job 24 hours a day. In many plants where minutes cannot be spared for "down time"—Reading Chain and Electric Hoists are helping to keep production schedules ahead of the clock.

When you have a tough materials handling problem to solve, rely on Reading's ability to design hoists that speed output by reducing maintenance troubles. And for printed help with your specific problems, ask for "*Modern Materials Handling Magic*". It tells how to specify special electric hoist equipment . . . at *standard equipment* cost.

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2½, 5, AND 10 TON CAPACITIES

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by Amendment No. 1: Terminal and curved sections, straight casings for carrying strands, and wearing bars for return strands. However, no steel exceeding 3/16 in. in thickness may be used for these exempted items.

•

CMP Reg. 5 to Replace P-100 for MRO Supplies

Washington

• • • **WPB on Monday revoked** Order P-100, general repair, maintenance and operating supplies order. The action was taken because producers who formerly used the ratings assigned under P-100 are permitted to operate within the terms of CMP Regulation No. 5 which assigns a preference rating of AA-1 to producers covered in its Schedule I, AA-2X to those covered in Schedule II and an A-10 rating to business activities not mentioned in either schedule. The revocation order provides that any serial numbered copy of P-100 issued to a producer in Canada shall remain in effect until it is specifically revoked or until the Canadian producer becomes eligible to apply ratings assigned by CMP Regulation 5.

•

P-142 to Govern MRO For Transportation Lines

Washington

• • • **To implement the** acquisition of materials needed for the operations of transportation systems, as contemplated under the Controlled Materials Plan, the War Production Board issued preference rating Order P-142. Heretofore, such acquisition has been governed by Orders P-88 and L-229, which are revoked, as of April 3. Basically, according to the Transportation Equipment Division of WPB, the new order is the medium for obtaining materials for maintenance, repair and operating supplies.

•

Civilian Trucks Cut

Washington

• • • **The number of heavy** trucks that may be manufactured for civilian use has been cut from 3580 to 3017 by amendment of Order L-1-h, WPB announced on Thursday of last week. The new figure represents an adjustment of the number of heavy trucks that may be produced to the number withdrawn from the civilian pool up to Dec. 31, 1942.

Order Rerating Is Clarified Under CMP Reg. No. 3

Washington

• • • **"The uprating of an order** by the application of an allotment number under CMP relates back, for the purpose of determining the sequence of delivery, to the date on which the original rating was applied to the order," WPB declared last Saturday in an interpretation of CMP Regulation No. 3.

The interpretation points out that the rerating accomplished by the application of an allotment number is governed by the rerating procedures established in Priorities Regulation No. 12. This means that the sequence of deliveries is to be determined as if a rated order, to which an allotment number is applied, actually bore the allotment number at the time it was first placed. It was emphasized that the interpretation covers only the use of allotment numbers as a rerating device and does not cover the placement of authorized controlled material orders, which is governed by CMP Regulation No. 1.

Persons having orders which are uprated by the use of allotment numbers must make any necessary adjustments in production and delivery schedules upon receipt of the allotment numbers. However, no producer will be required to terminate or interrupt a production schedule within 40 days after receipt of the rerating in any case where termination or interruption would result in substantial loss of production.

Producers are also prohibited from diverting materials, specifically produced for orders bearing preference ratings higher than A-2, and delivering them under higher rated orders if such materials are completed at the time the allotment number is received. The same prohibition applies where the order is scheduled for completion 15 days after allotment.

Krieger Heads Farm Division

• • • **George Krieger**, acting director of the WPB Farm Machinery and Equipment Division was appointed director of the division last Saturday by Donald D. Davis, vice chairman for operations. Before coming to Washington Mr. Krieger was manager of the agricultural engineering division of the Ethyl Corp., Detroit.

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We manufacture shot and grit for endurance

A shot or grit that will blast fast with a clean finish.

This is the only reason why so many operators are daily changing to our shot and grit, from Maine to California.

The unprecedented demand for our—

Heat-Treated Steel Shot and Heat-Treated Steel Grit

has enabled us to expand our production and maintain a quality that is more than satisfactory to our hundreds of customers all over the country.

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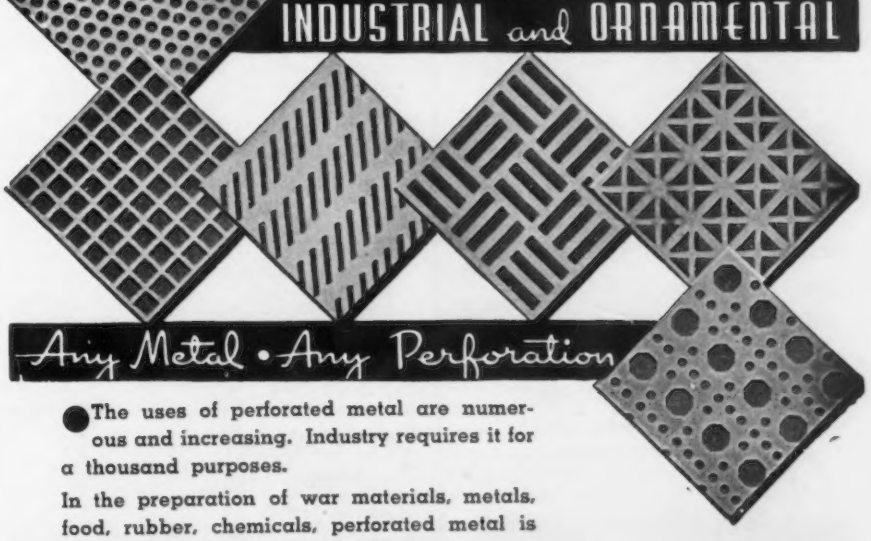
Manchester, New Hampshire

HEAT-TREATED STEEL GRIT

PERFORATED METAL

INDUSTRIAL and ORNAMENTAL



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1907

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Cited for Award

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Westinghouse Electric & Mfg. Co., East Pittsburgh.
Fred S. Gichner Iron Works, Inc., Washington.
Foster Wheel Corp., Dansville, N. Y. (star).
General Electric Co., Erie Works, Erie, Pa. (third star).
Stanley Tools Division and Stanley Electric Tools Division, Stanley Works, New Britain, Conn.
Mathews Conveyor Co., Elwood City, Pa.
Metallurgical Laboratories, Inc., Philadelphia.
Whiting Corp., Harvey, Ill.
Fred Howland, Inc., Florida Army Air Base, Orlando, Fla.
John McShain, Inc., and Hamilton Wilson, Arlington Hall Station, Arlington, Va.
C. G. Kershaw Contracting Co., Swinerton & Walberg Co., H. K. Ferguson Co., Whitman, Requardt and Smith, H. A. Kuljian & Co., and E. I. duPont de Nemours & Co., Inc., Rocky Mountain Arsenal Construction Project, Denver, Col.
Allis-Chalmers Mfg. Co., Supercharger Plant, Milwaukee.
American Gear & Mfg. Co., Chicago.
American Hydraulics, Inc., Sheboygan, Wis.
American Screw Machine Products, Inc., Chicago.
Bernhardt Mfg. Co., Charlotte, N. C.
The Cincinnati Planer Co., Oakley, Cincinnati.
General Ceramics and Steatite Corp., Plant No. 3, Keasbey, N. J.
The B. F. Goodrich Co., The Clarksville Division, Clarksville, Tenn.
Henry Heide, Inc., New York.
The Hughes-Keenan Co., Mansfield, Ohio.
Ben Hur Mfg. Co., Main Plant, Milwaukee.
William F. Jobbins, Inc., Aurora, Ill.
Lehigh Foundries, Inc., Easton, Pa.
Life Savers Corp., Port Chester, N. Y.
Louisville Tin and Stove Co., Louisville, Ky.
The Mason Silk Co., Winsted, Conn.
Merchant and Evans Co., Lancaster, Pa.
Monsanto Chemical Co., Longhorn Ordnance Works, Marshall, Texas.
National Union Radio Corp., Power Tube Division, Newark, N. J.
Reynolds Research Corp., Container Division, Louisville.
Rodney Milling Co., Kansas City Plant, Kansas City.
Rust Proofing and Metal Finishing Co., Cambridge, Mass.
Spencer Thermostat Co., Attleboro, Mass.
Stearns Mfg. Co., Adrian, Mich.
The Thresher Varnish Co., Pittsburgh Plate Glass Co., Dayton, Ohio.
Trojan Powder Co., Plum Brook Ordnance Works, Sandusky, Ohio.
United Steel & Wire Co., Battle Creek, Mich.

MARITIME COMMISSION "M"

Oregon Shipbuilding Corp., Portland, Ore. (tenth time).
Todd-Erie Basin Drydock Co., Brooklyn.
Bethlehem Steel Co. repair yards, Brooklyn and Hoboken, N. J.
Beaumont Iron Works Co., Beaumont, Texas.
Goldens' Foundry & Machine Co., Columbus, Ga.
Nordberg Mfg. Co., Milwaukee.
William Powell Co., Cincinnati.
Scott Graff Co., Duluth.
Washington Iron Works, Seattle.
Brooklyn Association for Improving the Condition of the Poor, Brooklyn.

DPC Contracts Awarded To Jessop Steel and Others

Washington

• • • **Defense Plant Corp.,** RFC subsidiary, has authorized the following contracts:

Jessop Steel Co., Washington, Pa., to provide additional facilities at a plant in Pennsylvania at a cost in excess of $240,000, making a total commitment of more than $1,600,000.

Commodity Credit Corp., Washington, D. C., for plant facilities four of which will be located in Illinois and four in Minnesota at a cost in excess of $350,000 each.

Shofner Iron & Steel Works, Portland, Ore., to provide additional plant facilities in Oregon at a cost in excess of $42,000, making a total commitment of more than $246,000.

Corod Minerals Corp., Marion, Ky., to provide additional plant facilities in Kentucky at a cost in excess of $70,000, making a total commitment of more than $215,000.

Luscombe Airplane Corp., West Trenton, N. J., to provide additional plant facilities in New Jersey at a cost in excess of $50,000, making a total commitment of more than $200,000.

Pacific Chain & Mfg. Co., Portland, Ore., to provide plant facilities in Oregon at a cost in excess of $200,000.

Bloomfield Mfg. Co., Chicago, Ill., to provide equipment at a plant in Illinois at a cost in excess of $42,000.

Export Prices Upped In New Price Revision

Washington

• • • **Payment of compensation** for export functions performed on Lend-Lease sales and an adjustment of export premiums to compensate for higher expenses are authorized in a new revision of the Maximum Export Price Regulation, OPA announced March 31.

Most far-reaching of these changes relates to sales to procurement agencies buying for the account of the Office of Lend-Lease Administration. Under an OPA ruling of last June 16, such sales hitherto have been treated as domestic sales and the seller was forbidden to charge more than his domestic ceiling price plus the extra packing charges permitted by Supplementary Order No. 34 issued Dec. 21, 1942. These transactions will now be recognized as export sales, OPA explained, and the seller is permitted to add to his domestic ceiling the difference between the greater cost of foreign installation and other services involved in the sale to the procurement agency and the cost of domestic installation or other services which would have been involved in a domestic sale. The seller is not, however, entitled to charge an export premium, OPA pointed out, nor is any provision made for the allowable expenses which are authorized in the case of ordinary export sales with the exception of extra export packing costs.

OPA emphasized that payment of such extra compensation is permissive and must be justified to the satisfaction of the procurement agency involved. In any given case, the amount of the compensation which the supplier receives will depend on the terms of the contract which he negotiates with the procurement agency.

Another important change is made with respect to calculation of allowable premiums on ordinary export sales. The exporter now is permitted to use as his allowable premium 125 per cent of the average premium which was charged in the trade for the performance of similar services or functions during the lower of the two base periods, July 1-Dec. 31, 1940, or March 1-April 15, 1942.

Warehousemen Meet OPA on Pricing Zones

• • • **Twenty-one members** of the heavy line iron and steel warehouse industry in a territory covering 11 eastern and mid-western states met with OPA officials in Washington Friday to discuss establishment of specific maximum prices for their products. Prices are now established under a "freeze date and formula" method.

Specific ceiling prices are about to be announced in four eastern zones or marketing areas. Friday's meeting was in preparation for setting them in a fifth zone that will include parts of New York State, Pennsylvania, Maryland, Virginia, North Carolina, Tennessee, Indiana, Michigan, and all of West Virginia, Kentucky, and Ohio. Ceilings for the zone will be contained in an amendment to Revised Price Schedule 49 (Resale of Iron or Steel Products).

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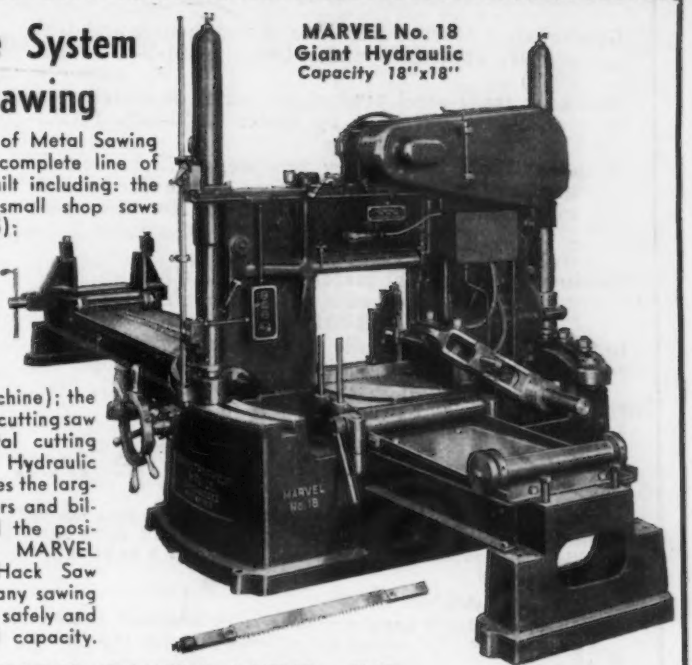
The Marvel System of Metal Sawing provides the most complete line of sawing machines built including: the most widely used small shop saws (80% are MARVELS); the fastest high speed hack saws built (automatics that will cut-off identical bars with no more operator attention than an automatic screw machine); the most versatile metal cutting saw—(a universal metal cutting band saw). Giant Hydraulic hack saw that handles the largest and toughest bars and billets with ease; and the positively unbreakable MARVEL High-Speed-Edge Hack Saw Blades that permit any sawing machine to operate safely and continuously at full capacity.



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TWO PLANTS FOR SPRING SERVICE
DETROIT and ANN ARBOR MICHIGAN
B-G-R PRODUCTS SERVE OUR COUNTRY-ON LAND, AT SEA, AND IN THE AIR

This Week's Priorities and Prices

General steel product deliveries to warehouses and dealers are controlled under Order M-21-b-1. (WPB-2984)

Merchant trade steel product deliveries to distributors are to be governed by Order M-21-b-2. (WPB-3036)

Aluminum sold by primary producers will be sold at levels 1c. per lb. below prices of the corresponding ingots, as set forth in Order No. 353 under Section 1499.3(b) of the General Maximum Price Regulations. (OPA-2101)

Calcium metal, a vital material for metallurgical uses, was placed under allocation through issuance of Order M-303. (WPB-3010)

Royalties paid by domestic mine operators for copper, lead, and zinc ores mined from leased properties have been frozen at rates in effect on Dec. 31, 1942, in Maximum Price Regulation No. 356. (OPA-2129)

Maximum prices on certain machinery and services have been clarified in Amendment No. 74 to Maximum Price Regulation No. 136. (OPA-T-727)

Non-electrical welding equipment including welding rods, welding wire, electrodes and supplies are covered by the machinery price regulation according to Amendment No. 73 to Maximum Price regulation No. 136. (OPA-T-727)

■ ■ ■

For copies of above announcements address Office of War Information, Washington, giving announcement number as shown in parentheses after each paragraph. (For example, WPB-600 *means announcement* 600 *issued by the War Production Board.)*

Revisions to The Iron Age Priorities Guide

• • • The following data, together with all intermediate weekly revisions in THE IRON AGE, should be added to THE IRON AGE Priorities Guide published with the issue of October 8 to bring the Guide up to date.

"Priority Regulations":

No. 11A...Amendment permits purchasers of fabricated items to continue their PRP ratings during second quarter (4-1-43).

"M" Orders:

M-21...Amended order makes certain formal changes governing deliveries of iron and steel products (3-31-43).
M-21-b...Revoked (4-1-43).
M-21-b-1...Order governs deliveries of general steel products to warehouses and dealers (3-29-43).
M-21-b-2...Order sets up procedures for distribution of steel through warehouses and dealers (4-1-43).
M-119...Revoked (3-30-43).
M-255...Amended order directs users to apply for authorization to purchase new steel drums or parts on Form PD-835 (3-29-43).
M-293...Amendment changes date after which deliveries of certain items may be made (3-31-43).
M-303...Order places calcium metal under allocation (3-31-43).

"P" Orders:

P-29...Revoked (4-2-43).
P-100...Revoked (4-2-43).

"L" Orders:

L-7-c...Amended order sets ice refrigerator production quota for next quarter (3-29-43).
L-28...Amended order permits production of electric lights for civilian use (3-31-43).
L-28-a...Amended order allows manufacturers of incandescent lamps to apply to WPB for authorization to use tungsten and other materials (4-1-43).
L-59-b...Amended order eases restrictions on the manufacture of metal plastering bases (4-1-43).
L-126...Schedule VI limits use of copper tubing in refrigerators and air-conditioning (3-29-43).
L-211...Amended order permits production of certain poultry netting (3-31-43).
L-280...Amendment releases for distribution certain fans used in connection with furnaces (3-31-43).

Welding Rods, Added to MPR-136

• • • Non-electrical welding equipment including welding rods, welding wire, electrodes, and supplies, are covered by the machinery price regulation, OPA announced Friday.

To formalize the inclusion of these items of welding equipment under the regulation, OPA issued Amendment No. 73 to Maximum Price Regulation No. 136, which becomes effective April 8.

Diamond dies which are .002 inch in diameter or larger are covered by Amendment No. 75 to Maximum Price Regulation No. 136, effective April 8, 1943. Formerly diamond dies smaller than .002 inch in diameter were the only diamond dies specifically excluded from the dies, molds and patterns section of the machinery regulation and these dies remain exempt from price control under the provisions of Supplementary Regulation No. 1.

The status for several machinery items under price regulations was changed. Amendment No. 74 to Maximum Price Regulation No. 136 accomplished the following changes:

1. Only power operated marine and industrial soot blowers and tube cleaners are covered by Regulation No. 136.
2. Under the item "foundry machinery" in Regulation 136 the exclusion of ladles over 40 tons' capacity is effected.
3. Space heating furnaces and stoves, blast furnaces, open hearth furnaces, Bessemer converters, soaking pits, coke ovens, and industrial furnaces used solely for the manufacture of pig iron and steel are excluded from Regulation No. 136.
4. A change of the classification of flanged wheel mining and industrial cars from an item of "material handling equipment" to "freight cars" is effected but does not change the status of the item under price control as it remains under Regulation No. 136.
5. The illustrative examples of material handling equipment under the regulation are changed from "cars, trucks and racks, etc." to "skid platforms, cars and trucks except those equipped with flanged wheels, racks, except shelving and stationary storage racks, etc."

The amendment is effective April 8.

Beehive Coke Raised For West Virginia Ovens

• • • Beehive oven furnace coke produced in three counties of West Virginia adjacent to and usually considered as being in the Connellsville (Pa.) district, are to be priced under the same price regulation as that for beehive oven furnace coke produced in Pennsylvania, through action taken last Wednesday by OPA.

The new price applying in the three West Virginia counties to hand-drawn beehive oven furnace coke whose coal must be trucked from the mine is $7 per net ton f. o. b. Connellsville, Pa. Transportation charges from Connellsville to the place of delivery, as customarily computed, may be added. Machine-drawn beehive oven coke is priced similarly, but at $6.50 per net ton.

New Price Basis Set For Used Machinery, Parts

• • • An alternative ceiling for used machinery and second-hand machine parts, which is based, in general, on standard depreciation rates and allows sellers in some instances to obtain higher prices than existing maximums, was announced by OPA.

The new pricing method is contained in Amendment No. 76 to Maximum Price Regulation No. 136 (Machines and Parts and Machinery

Services), which becomes effective April 10, 1943.

In effect, the action provides that a seller of a used machine can determine his ceiling price by either of the methods outlined below:

(1) Using the "flat ceiling" formula—established previously by the regulation—that is 85 per cent of the maximum price for the nearest new equivalent machine f.o.b. factory, for a reconditioned and guaranteed machine or part, or 55 per cent of the maximum price for the nearest new machine, for an "as is" or other machine not guaranteed nor rebuilt, or

(2) Using the same "new base price"—that is the maximum price for the nearest equivalent new machine—and reducing it by the depreciation rate listed in a table now contained in the regulation from the date of acquisition when new to the date of sale.

Alloy Shot Re-priced Under Price Regulation 202

Washington

• • • **Brass and bronze** alloy shot was put under control of Maximum Price Regulation 202 governing bronze alloy ingot by OPA on Tuesday. Pricing of brass and bronze alloy shot was previously under GMPR and had led to difficulties which amounted to individual applications for specific prices. The procedure provided for pricing of the shot is similar to that provided for pricing special alloy ingots. Maximum prices for shot already established by OPA under GMPR are approved under the amendment and pending applications may be used until prices are changed.

New Listings Issued to Clarify A and B Products

Washington

• • • **Several classification** changes were made by WPB last week with respect to Class A and B products. The following were classified as Class B: Reinforced concrete pipe—pressure, culvert and sewer; precast reinforced concrete products; bolts, nuts, rivets, except aluminum rivets; washers, screws, studs and pins (such as cotter, clevis, break, knuckle and taber.)

Bolts, nuts and rivets may be Class A if they are not produced as screw machine products. However, any of such items produced and specifically designed for a particular end product may be handled in the same manner as a Class A product by special arrangement with the WPB Building Materials Division.

Renegotiations Agreement Reached

Washington

• • • **Uniform price adjustment** policies were adopted last week by the price adjustment boards of the War, Navy and Treasury Departments and the Maritime Commission, which, in a joint statement pointed out the procedure that will be followed in the renegotiation of war contracts under Sec. 403 of the National Defense Appropriation Act of 1942.

Under this section the boards will determine, by agreement, the amount of profits which exceed a fair margin. The section was written into law because industry has been asked to produce war equipment for which accurate data did not or does not exist, the boards explained.

It was pointed out that "in the present emergency the existence of excessive profits does not necessarily indicate that a contractor has taken undue advantage of the government or that the contracting officers have failed to exercise good judgment under all circumstances." Costs and profits, at the time contracts are made may, at best, represent estimates, it was stated, with a result that "contractors, in many instances are left with profits which they neither anticipated nor wish to retain."

Broadly speaking the statement said the following principles have been agreed upon in determining excessive profits.

That the stimulation of quantity production is of primary importance.

That reasonable profits in every case will be determined without limitation or restriction by any fixed formula.

That the profits of the contractor ordinarily will be determined on his war business as a whole for a fiscal period.

That as volume increases the margin of profit should decrease.

That in determining what margin of profit is fair, consideration should be given to the corresponding profits in pre-war base years, especially in cases where the war products are substantially like pre-war products.

That the reasonableness of profits shall be determined before provision for federal income and excess profits taxes.

That a contractor's right to a reasonable profit and his need for working capital should be differentiated.

Warehouse Price Zones To Be Announced

Washington

• • • **Specific price ceilings for many iron and steel warehouse products in four Eastern zones or marketing areas are expected to be submitted on Thursday of the present week at a meeting in Boston of OPA officials with warehousemen and industrial users.**

Part of an OPA program intended eventually to cover all marketing zones in the United States, the amendment will fit operation of the price schedule for the resale of iron or steel products to market conditions in each area and, by setting specific ceiling prices for each zone, will increase the facility with which buyers and sellers can operate under it.

NE Steels May Become Mandatory and WPB Directed

Washington

• • • **As WPB announced** on Tuesday that it had renewed the arrangement made last year to stimulate the use of plain carbon steel and the new NE steels, trade sources say that the time is closer when NE steels will become mandatory for every use. When NE steels become mandatory, all heats will be directed by the WPB Steel Division with all melting within the range of NE steels with few exceptions.

Under the arrangement which has been renewed, sample quantities of steel for experimental purposes can be delivered to manufacturers or laboratories without regard to preference ratings or authorized controlled materials orders. Such samples are shipped direct and may be taken from current mill production or from stock.

Manufacturers wishing to obtain samples are asked to certify on the purchase order that the steel is to be used for tests, that the amount of steel ordered added to the amounts already received or on order from other sources will not amount to more than 1000 lb. of each analysis; and that the total amounts of all analyses on hand or ordered from all sources for testing does not exceed 3000 lb. These limitations are for the second quarter of 1943.

Furnace Halted for First Complete Relining in Decade

Birmingham

• • • **Ensley blast furnace** No. 5 of the Tennessee Coal, Iron & Railroad Co. was taken off April 4 for complete relining. Work is expected to be completed in about 60 days. The furnace had not been completely relined since 1933.

PERSONALS

• **Charles R. Cox** has been elected president of the National Tube Co. and of Tubular Alloy Steel Corp., subsidiaries of the U. S. Steel Corp. Mr. Cox, who for the past two years had been executive vice-president of National Tube, will succeed **Benjamin F. Harris**, who recently resigned. Mr. Harris is now a consultant to Mr. Fairless in connection with war activities. Going to the National Tube Co. from his position as superintendent of Babcock & Wilcox Tube Co., Beaver Falls, Pa., in 1934, Mr. Cox was employed at the Ellwood Works, Ellwood City, Pa., where he soon became general superintendent of the plant. In 1936, he was appointed vice-president in charge of operations, National Tube Co., with offices in Pittsburgh.

• **Helge G. Hoglund**, sales manager of the machine tool division of Van Norman Machine Tool Co. for the past 10 years, has been appointed vice-president of the company. Mr. Hoglund will continue to be in charge of sales of the machine tool division. In addition, he will have complete control of sales of the new electronics division which is manufacturing induction heating equipment.

• **Dr. Charles M. Slack**, has been appointed assistant director of research at the Westinghouse Lamp Division, Bloomfield, N. J. Dr. Slack is well known in the field of electronics research and for his contributions to the development of an ultra high-speed X-ray machine that is making possible the wartime studies of bullets as they crash through armor plate. In his new position as assistant to Dr. Harvey C. Rentschler, research director, Dr. Slack will direct experimental work on various lamp and electronic problems. Additional responsibilities also have been assigned to **Dr. John W. Marden** who has been assistant director of research for the past 15 years. Although continuing in his present position, Dr. Marden will assume complete charge of metals research, an activity which has expanded greatly since the outbreak of the war.

• **Peter Altman**, director of the manufacturing research department of Vultee Aircraft, Inc., has resigned to form a consulting and developing service in Detroit. Before organizing the manufacturing research department of Vultee, Mr. Altman was director of the aeronautics department at the University of Detroit where he engaged in consulting and development work on many projects.

• **Dean A. Powers**, electrical engineer, has been appointed to the research staff of Battelle Memorial Institute, Columbus, Ohio, where he will assist in electrochemical and electrometallurgical research. **Ellsworth E. Kimmel**, former research chemist with the Carnegie-Illinois Steel Corp., has also been added to Battelle's research staff and assigned to its division of chemical research.

• **Andrew F. Furlani** has been elected vice-president in charge of operations of Hartford Electric Steel Corp. and Roxbury Steel Casting Co.

• **E. A. Considine** has been appointed as assistant to H. G. Irwin, Sr., of the H. G. Irwin Lumber Co., Garland, Pa.

• **Frederick V. Geier**, president of the Cincinnati Milling Machine Co., Cincinnati, has been named chairman of the local committee on organization for the committee of economical developments. This national industrial group is to confine its attention to post-war employment planning.

• **Malcolm E. Erskine**, president of the Racine Tool & Machine Co., and a director of the Twin Disc Clutch Co., Racine, has been elected president of the Manufacturers' Association of that city at its annual election, succeeding W. K. Hyslop.

• **Thomas T. Bakke**, formerly with the engineering and service departments, Milwaukee branch, Westinghouse Electric & Mfg. Co., has been appointed manager of the Milwaukee branch manufacturing and repair division. He joined Westinghouse in 1923 as a field service engineer in the Chicago office and was transferred to Milwaukee in 1927.

• **Cuyler S. Patton**, manager of sales for the Alco Products Division of the American Locomotive Co., has been elected president of the Tubular Exchanger Manufacturers Association at the annual meeting held in New York. Mr. Patton has been prominent

CHARLES R. COX, president of National Tube Co., and of Tubular Alloy Steel Corp., United States Steel Corp. subsidiaries.

HELGE G. HOGLUND, vice-president, Van Norman Machine Tool Co.

DR. CHARLES M. SLACK, assistant director of research, Westinghouse Lamp Division.

in the activities of the association for many years and has served several terms on its executive committee.

• **Milton K. Mahler,** of Morrow Steel Co., Detroit, has been appointed chairman of the industrial relations committee of the Institute of Scrap Iron & Steel Inc., which will handle labor and allied problems of the scrap industry, which are becoming more grave. **Richard V. Bonomo,** of Schiavone-Bonomo Corp., Jersey City, has been named vice-chairman of the committee.

• **C. E. Scott** has been elected president of the Industrial Unit Heater Association, Detroit. Other officers elected are: **E. W. Petersen,** vice-president and **L. O. Monroe,** secretary-treasurer.

• **Chester F. Conner,** with B. F. Goodrich Co. for nearly 33 years, has been named merchandise manager of industrial product sales. **Jay E. Miller** has been appointed sales promotion manager and **Harold F. Mosher,** manager, special industrial merchandise.

Changes made in the national sales and service division include: **E. D. Nathan** in charge of division sales promotion; **G. G. Zimmerman,** in charge of aeronautical sales for the division in Washington, is transferred to Dayton, Ohio, in charge of that activity there; **F. T. Marshall** succeeds Mr. Zimmerman in Washington and will continue in charge of the Baltimore office; **H. F. Bichsel, Earl Kambrich** and **W. E. Ireland** have been assigned to the Washington office, Mr. Bichsel on fabric and inflatable products sales, Mr. Kambrich on other aeronautical products and Mr. Ireland on tire, tube and accessory sales. A new office is being opened by the division in Atlanta and **Maury M. Calvert** has been named manager. **E. E. Bost** has joined the Dallas, Tex., staff, in charge of aeronautical and automotive sales in that area.

• **Grover D. Motherwell** has been appointed manager of the Minneapolis district of the B. F. Goodrich Co., succeeding Arthur J. Martin, who died recently.

S. A. Walker, manager of the Philadelphia division of the Industrial Products division of the B. F. Goodrich Co., has completed 30 years of service with his organization this month.

• **Dr. Irving Langmuir,** associate director of the General Electric Research Laboratory, Schenectady, has been elected to honorary membership in the Institute of Metals, of London. Though Dr. Langmuir has not recently engaged directly in the science of metallurgy, his work has had considerable indirect effect.

• **Dr. Harold Moore,** C.B.E., a fellow of the Institute of Metals, London, of which he was president from 1934 to 1936, has been awarded the Institute of Metals medal which is offered to the council of the Institute by the Mond Nickel Co., Ltd. He has received the medal as one who has rendered outstanding services to non-ferrous metallurgy.

• **James L. McCarthy,** engineering representative for Westinghouse Electric & Mfg. Co. at Honolulu, has been awarded the company's order of merit for distinguished service, which was presented to his son and daughter since he could not come from Honolulu to receive the award in person.

• **E. C. Bullard,** vice-president and general manager of the Bullard Co., Bridgeport, Conn., marked his 25th year with the firm on March 18. He was guest of the Bullard Foremen's club at a dinner attended by 200 members and friends.

• **M. B. Sunderland** has been appointed manager of sales in charge of Carnegie-Illinois Steel Corp.'s newly established Low Alloy-High Tensile Steel Products Division in its sales department, with headquarters in the Carnegie Building, Pittsburgh. **Charles F. Dickinson,** formerly manager of the sheet and strip bureau, metallurgical division, in the Chicago district of Carnegie-Illinois, will succeed Mr. Sunderland as metallurgical engineer, sheet and strip, for the Pittsburgh district.

• **F. O. Cooper** has been appointed manager of the sheet and strip bureau of the Chicago metallurgical division of Carnegie-Illinois Steel Corp. Mr. Cooper's service began in 1905 when he was employed as a weighmaster at the Monessen, Pa., plant of the American Sheet & Tin Plate Co. He was assistant works auditor when he left Monessen in 1911 to go to the Gary, Ind., sheet mill as superintendent of production and shipping. In 1925 he was appointed asistant to the manager of the Gary sheet mill, a position he held for approximately 10 years. He was transferred to the metallurgical department in the Chicago office in 1935 as a contact representative and served in this capacity until receiving his present appointment.

• **Dr. Edgar C. Bain** has been made vice-president in charge of research and technology for Carnegie-Illinois Steel Corp., a new office, having previously been assistant to the vice-president in charge of research and technology, United States Steel Corp. of Delaware, since 1938.

The establishment of the position at Carnegie-Illinois with the appointment of Dr. Bain followed closely on the heels of the Truman Committee hearings covering alleged faked tests and analysis at the Irvin Works of Carnegie-Illinois. The change also is believed to represent a prompt carrying out of statements by B. F. Fairless, president U. S. Steel Corp., and J. L. Perry, president Carnegie-Illinois Steel Corp., to the effect that the company would make a prompt investigation of the alleged irregularities and prevent any recurrence. Dr. Bain is well known among metallurgists for his studies of stainless steel, hardening of steel, and the influence of various alloys on steel.

• **A. L. Golay** has been added to the refrigeration application engineering and service staff, of Kold-Hold Mfg. Co., Lansing, Mich. Mr. Golay will have Kold-Hold's Mid West territory, comprising Missouri, Iowa, Kansas, Nebraska and part of Minnesota.

OBITUARY...

• **C. T. Keigley,** general superintendent of Utah operations for the Columbia Steel Co., died suddenly in his home in Provo, Utah, March 11. He was 50 years old. Mr. Keigley had been associated with Columbia Steel since 1923 when the present company was the old Columbia Steel Corp. He assisted in supervising the construction of the company's Ironton, Utah, plant, and following completion of the plant was appointed superintendent of coke ovens. In 1933, he was appointed superintendent of Utah operations for Columbia Steel Co.

• **Norman H. Taylor,** comptroller of Dominion Bridge Co. Ltd., died of a heart attack March 11. Mr. Taylor was associated with Dominion Bridge Co., for 36 years. He was past-president of the Toronto Purchasing Agents' Association; secretary-treasurer of Sault Structural Steel Co. Ltd., and secretary-treasurer of the McGregor-McIntyre Iron Works Ltd.

• **Frank A. Ball,** who became president of the Starrett Tool Co., Athol, Mass., after the death of its founder and who retired three years ago, died March 6 in Florida. He was 84 years old.

• **Daniel E. Hamill,** for 40 years superintendent of the General Electric Co., Lynn, Mass., gear department, died March 7, aged 68 years.

MACHINE TOOLS

. . . Sales, Inquiries and Market News

Machine Tool Orders Half of Capacity

Cincinnati

• • • **Cancellations of machine tool** orders have dwindled to a mere trickle at the present time, while new business continues to be at a comfortable rate. Manufacturers generally indicate that the present rate of bookings is above the 1937 rate and would be considered a very nice volume of business under normal times. Such a volume, however, does not support a rate of production at the present high level, but the feeling is that it warrants operations at about half of the present productivity. Accordingly, machine tool builders are now eating into their backlogs at a fair rate, although there is no anticipation of a decrease in factory schedules for the remainder of this year. Renegotiation of contracts continues to disturb manufacturers, although there are no reports of the completion of negotiations in any local plants. Most machine tool builders have supplied the data required by government inspectors and one or two are busy in the negotiation procedure, but so far no definite results have been reported.

Personnel men indicate that the labor supply is definitely becoming less but has not yet affected operations.

•

Bullard Net Is Up

Bridgeport

• • • **The 1942 net profit** of Bullard Co. after provision of $1,200,000 for post war losses and other adjustments was $2,381,279, equal to $8.63 a share. Net for 1941 after a reserve of $30,000 for post war adjustments was $1,977,909, or $7.16 a share. After deducting $61,816 for debt retirement credit and $948,583 for post war refund, excess profits taxes were $9,093,000. Federal income taxes for 1941 were $916,000 and excess profits $3,488,000.

•

Turret Lathe Chip Pans Now Drawn from Plate

Cleveland

• • • **While the machine** tool industry, as a producer, is pretty much a self-contained and closely knit industry, there are occasions when a builder finds it more convenient or more economical to sub-contract the production of some parts that are integral parts of machine tools. When that sub-contractor can find better or faster production methods, it reflects not only his own ingenuity but also the ability of the machine tool manufacturer in choosing carefully his suppliers of parts and equipment.

Today, under the impetus of war and the demand for an incredible quantity of producers' goods, new techniques are being developed. One example that might be mentioned in this category is pan for turret lathes. Midland Steel Products Co., Cleveland, at present produces nine different sizes of turret lathe pans for Warner & Swasey Co., Cleveland, one of the largest producers of turret lathes. These pans range in size from 22 x 58 in. to 44 x 136 in., with draws from 3½ to 5½ in.

Originally, such pans were cast and later a rolling and bending process combined with welding was used. However, a rush order for a quantity of lathes far beyond any past experience of the manufacturer necessitated a faster production method for the lathe pans. The principles of quantity production were studied by Midland and it was decided to undertake the task as a press drawing job with gang punching of all holes including reservoir openings, which were formerly burned out.

The punch was mounted on the press bed instead of on the moving slide, and the descending die bends the 3/16 in. low carbon sheet for about two-thirds of the depth before catching it at each of the four edges to complete the draw. Consequently, the only surplus metal is that which constitutes the difference between the square corners of the original sheet and the radius of the die corner, and this surplus is quickly burned off.

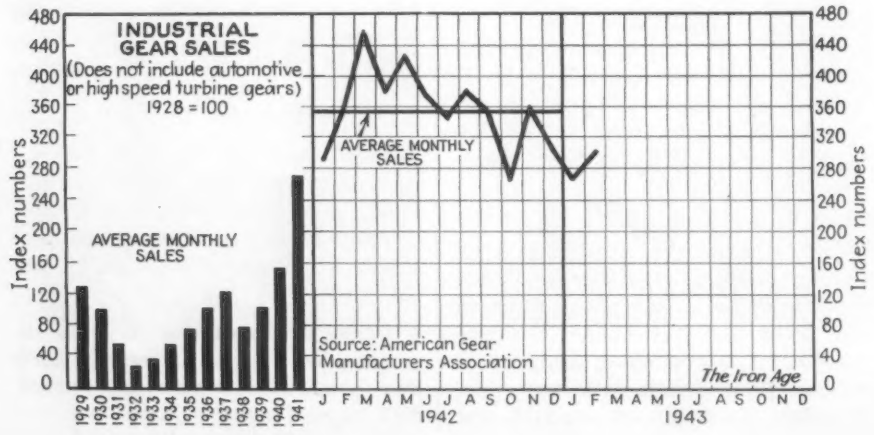
Blanking out the oil reservoir opening and the gang-punching of each cluster of holes is accomplished by locating the first cluster with reference to an established point and indexing the remaining clusters with respect to the first. This provides a pan with corners drawn solid and all attachment holes so located as to assure ready assembly of the pan to the lathe.

Reservoir assemblies are formed in one stroke, as compared with slower brake forming heretofore used. The corners of the assemblies still are welded since reservoirs of varying dimensions may be called for on pans of a single size. Clinch nuts are projection welded to the pan for reservoir cover hold-down bolts, thus eliminating tapping of gang-punched hole clusters.

The pan and sub-assemblies are jig assembled, being handled on a traveling crane. Completed pans are suspended from a powered conveyor line and run through a paint booth for prime coating. The result of this improved manufacturing process was not only the saving of time, but the solid rounded corners of the pans facilitate chip removal when the lathe is in use.

Gear Sales Increased 13.3 Per Cent in February

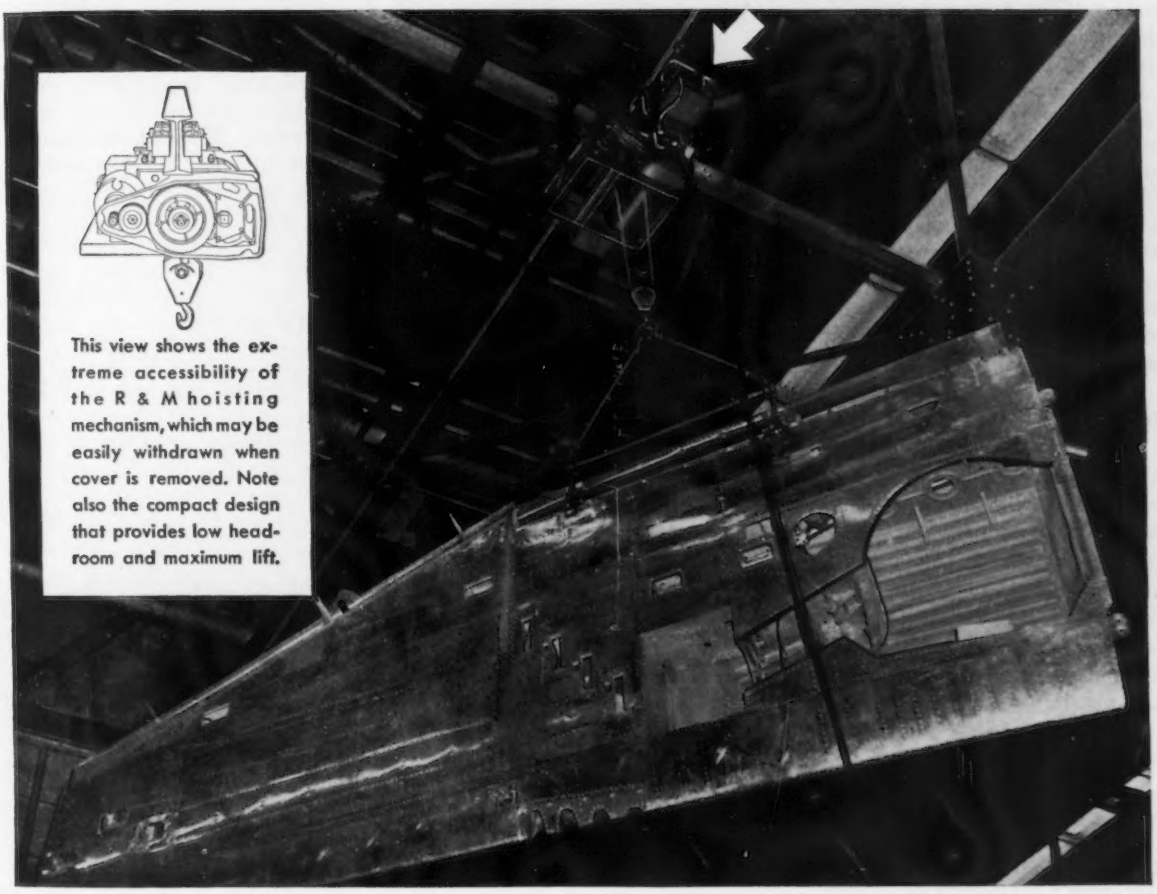
. . . The gearing industry as represented by the members of the American Gear Manufacturers Association shows an increase of 13.3 per cent in the business booked in February, as compared with January. The February index figure was 303 compared with 268 for January.



Republic Aviation

Speeds Work with NUMBER CENSORED R & M Hoists!

They Convey "Thunderbolt" Assemblies, Saving Time and Labor



This view shows the extreme accessibility of the R & M hoisting mechanism, which may be easily withdrawn when cover is removed. Note also the compact design that provides low headroom and maximum lift.

In the roaring plant of Republic Aviation Corporation, now pouring out sleek "Thunderbolt" fighters in deadly numbers, a squadron of performance-famous R & M All-Steel Hoists is helping *lift* production to new records! One of them is shown above, mounted on a motor-driven trolley, "air-expressing" a wing to an assembly line.

In many other departments, too, they are performing vital jobs that call for the utmost in speed, safety and accuracy. 2000-h.p. engines are installed, and fuselages are conveyed through final operations —with complete dependability despite pyramiding schedules, and with minimum maintenance!

Here are just a *few* of the reasons why R & M All-Steel Hoists have "what it takes" for war production. They're precision-built from track to hook; they're powered by famous R & M motors; they're perfectly balanced; they're equipped with an oversize oil-cooled automatic load brake. Hundreds of R & M models, from 1000 to 15,000 lbs. in capacity, are available to fit any application.

Whatever *your* hoisting problem, "take it up" with R & M! Our expert representatives will help you find the solution. Call the nearest R & M sales and service office, or write us.

R & M HOIST AND CRANE SALES AND SERVICE OFFICES

Albany.....364 Broadway
Atlanta.....319 Walton Bldg.
Baltimore, Lombard & Concord St.
Boston.....74 Needham St.
Chicago....2400 W. Madison St.
Cincinnati.....418 New St.
Cleveland..470 Rockefeller Bldg.
Denver.....1420 16th St.
Detroit.....2921 E. Grand Blvd.
Houston..3715 Harrisburg Blvd.
Jacksonville....305 Bisbee Bldg.
Meriden, Conn....135 Colony St.
Newark.....700 Bergen St.
New York.....200 Varick St.
Philadelphia.....401 N. Broad St.
Pittsburgh.....H. W. Oliver Bldg.
Providence.....44 Clifford St.
San Francisco, 116 New Mtgmry. St.
Seattle.....216 Walker Bldg.
Syracuse....204 State Tower Bldg.
Montreal.....Lyman Tube & Supply Co., Ltd.

KEEP 'EM HOISTING!

If you have R & M equipment, send for new maintenance folder, "How to get the most out of your Robbins & Myers Hoists and Cranes."

ROBBINS & MYERS • INC.

HOIST & CRANE DIVISION, SPRINGFIELD, OHIO • In Canada: Robbins & Myers Co. of Canada, Ltd., Brantford, Ont.

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NON-FERROUS METALS

. . . Market Activities and Price Trends

Carrier Substitutes Steel for Copper Coils

• • • **With the use of copper** restricted by WPB, a program has been set up at the Carrier Corp. to obtain substitutes for copper coils—long used in air conditioning equipment. With the idea of converting from copper to steel coils, the program was in two parts: (1) laboratory study, and (2) manufacturing procedure.

The laboratory study was to learn how steel coils compared with copper coils for heating; how much surface of one would give off as much heat at the other, with equivalent steam circulating through the coils. The study was, in the main, one of heat transfer.

The finned tubes used in Carrier and Aerofin coils, formerly made of copper and with copper fins, had a high rate of transfer. The thickness, weight and number of fins per inch were all balanced to provide a highly efficient heat transfer surface. Now, the dimensions had to be selected for steel tubing, and fins for the highest efficiency possible. At the same time the low resistance to air flow offered by the copper coil was the goal of the designers of the steel finned coils.

Simultaneous with the laboratory study, manufacturing experiments were carried on. The finning machines in the factory were adjusted to build the different coils for test purposes. The close cooperation of the development and manufacturing departments resulted in the completion of the recommendations for sizes and the establishing of methods of finning on a production basis without delay.

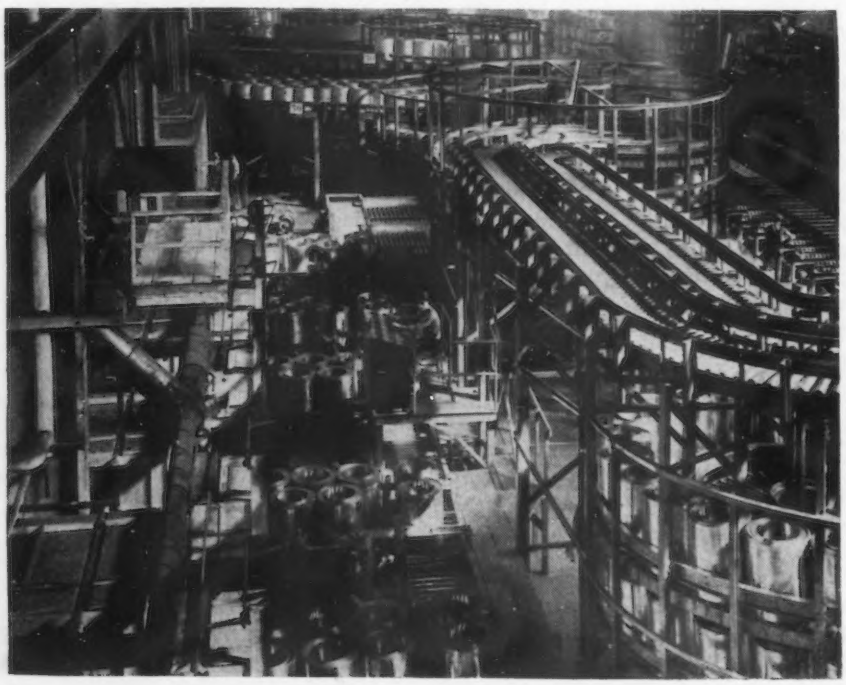
Next to be considered were the length of the finned tubing and the headers to use for best results. The number of headers was to be kept at a minimum to simplify manufacturing and stocking. In an effort to determine the best headers to use, a large number of designs were considered. These included welded steel headers made of steel pipe formed into the desired shape, and small headers, such as distributors, of cast and malleable iron parts. Cast iron and cast steel headers were also considered. The results of the studies led to the selection of welded steel headers for the strength feature they offered, and was well worth the design and tooling program involved.

Over 60 sample joints were made under controlled conditions and given pull tests to discover the strongest joint possible between the tube and header. Various clearances between the o. d. of the tube and the hole in the header in which the tube must be fastened were considered. The strongest joint proved to be silver soldering with a hole clearance between 0.004 in. and 0.010 in. No weakening of the tube or header was caused by the procedure in making such a joint.

Bonding the fins to the tubes and protecting surfaces against corrosion was another problem presented with the use of substitute material. Painting studies indicated that the surfaces could not be painted satisfactorily on a production basis. The need to conserve tin introduced a second substitution of critical material. Instead of the tinned surface, a new formula had to be found that would provide the features of the former coating for bonding and corrosion protection, and still not use a restricted metal. Lead coating, zinc coating and copper washing were tried, with copper wash or lead coat selected as the finish to use on these substitute coils. Hot dipped galvanized coils have been accepted as standard for low temperature work.

The new coil compares favorably with the one it replaces to save critical material. It is as strong as a copper finned coil and is 85 per cent as efficient in heat transfer. The manufacturing procedure has been developed so that the cost of the substitute coil is comparable with the cost of the original coil.

INTRICATE CONVEYORS take rolls of brass sheet for shell cases at the Western Cartridge Co.



Alcoa Earnings Down 18%

• • • **Despite a 50 per cent** increase in aluminum production for 1942 over the preceding year, net earnings of the Aluminum Co. of America show a decrease of 18 per cent. Net income for 1942 was $33,361,761.51 as compared with $40,882,134.47 for the year 1941. This reduction in net earnings was the result of 75 per cent increase in payroll disbursements, which totaled $173,351,303.76, and payments to the government through taxes and re-

negotiation, amounting to $141,570,493.14.

The renegotiation with the government, which was in effect the company's sole customer, came about through improved manufacturing facilities and technique plus a larger volume. It amounted to $76,000,000. However, had renegotiation not occurred, $61,500,000 of this sum would have been paid in taxes anyway. This is $14,500,000 more than would have been received by the government through the normal tax procedure.

•

Caveat Vendor

• • • **Unauthorized sales of tin** and the continued use of the metal for purposes that are prohibited by WPB's Tin Conservation Order will not be tolerated, Erwin Vogelsang, director of the Tin-Lead Division, declared March 31 in releasing a report of the initial meeting of a newly formed Tin Products Industry Advisory Committee, March 26, in Washington. Black market operations in tin must and will be stopped, he warned.

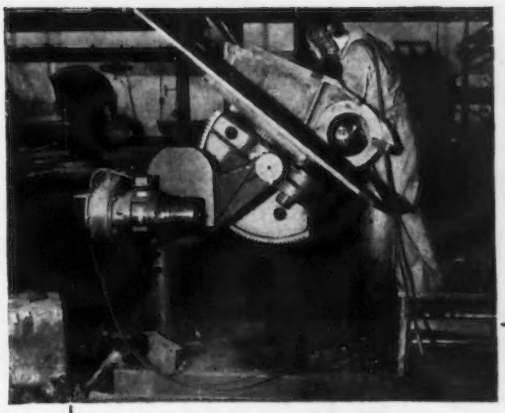
It has come to the attention of the Tin-Lead Division that body solder is being sold and used without authorization for repairing bodies and fenders of automobiles.

•

Metals Reserve to Continue

• • • **Jesse Jones, Secretary of Commerce,** announced March 30 the extension by Metals Reserve Co. for an additional 12 months from Dec., 1943, to Dec. 31, 1944, of the effective period of the following purchase programs: (1) Domestic mercury, as described in Metals Reserve Co.'s circular of July 9, 1942; (2) Domestic tungsten, as described in Metals Reserve Co.'s circular of Nov. 16, 1942; (3) Small lots of domestic chrome and manganese ores and concentrates at purchase depots, as described in Metals Reserve Co.'s circular of Sept. 10, 1942, and (4) Small lots of domestic tin and antimony ores and concentrates at purchase depots, as described in Metals Reserve Co.'s circular of Nov. 25, 1942.

The principal modification in the mercury and tungsten programs, as extended, is the provision that the existing prices for mercury and tungsten, respectively, will remain firm to all qualified producers ("new" or "eligible") until Dec. 31, 1943, with Metals Reserve to have the right to terminate these programs after Dec. 31, 1943, by effecting settlements with all qualified producers, upon the terms originally announced under the respective programs as applicable solely to "eligible producers" participating.



C-F POSITIONERS

Speed Production and Job Welding

Write for Bulletin WP 22.

C-F Positioners make welding a faster and more economical operation—save time, save man-hours. The welder himself turns and tilts and positions even the clumsiest and heaviest weldments with a push button control — without cranes, crane crews, hoist, jacks or "flopping" space. All sides can be welded down-hand—all welds can be made faster with heavier rods; made stronger, smoother and flawless.

C-F Positioners come in sizes and types for every welding need—range from small hand operated units for light job work to giant positioners that swing great weldments weighing 30,000 lbs. All have platforms that rotate the full 360° and tilt to 135° beyond horizontal. *All are adjustable for height and are pedestal mounted to give greatest floor clearance.*

CULLEN-FRIESTEDT CO.,
1303 S. KILBOURN AVE. CHICAGO, ILLINOIS

★ ★

Manufacturer, in business for over fifty years, with large well equipped shops, located on Eastern seaboard, competent engineering department, National sales connections and ample capital is interested in additional products to manufacture at termination of war on account of greatly enlarged facilities. Plants are completely equipped with highest grade large machine tools, heavy cranes, and suited to precision manufacture and assembly of heavy machinery.

Any proposals made will be given careful confidential consideration.

ADDRESS BOX V-516

Care *The Iron Age*, 100 E. 42nd St., New York

★ ★

SCRAP

. . . Market Activities and Quotation Trends

Mill Consumption Up; Yards Shipments Slow

• • • **Steel mills this week** were consuming scrap at the highest rate on record while many yards loafed in a business lull with volume generally being very light in both receipts and shipments. Some grades, including No. 1 heavy melting and No. 1 bundles were in demand but the general attitude of the mills was one of choosiness with little interest in buying. Turnings still represent a problem despite many recent efforts to get this grade moving and some alloy turnings were as good as in dead storage.

It is believed by some that mill choosiness is the result of a desire to work off inventories of undesirable scrap on hand, some of which is a hangover from last winter's junk collections, along with which only choice heavy scrap is being purchased and used. Thus while the scrap trade bemoans the slack business, a general balancing of mill inventories is seen in this move. St. Louis district is complaining of poor quality offerings and is requiring allocations of better material from other sources. Other sections of the country, such as Chicago, where labor has knocked out the scrap flow for some time, are returning to normal and business is reported to be considerably more brisk.

One problem which may occur later is a strong demand by mills on yards that have not been getting in much material which could result in temporary shortages in districts. Depending on the timing, scrap drives which are now getting under way could easily offset such a shortage depending on labor being available to process the material.

Part of the current slackness in scrap yards is attributed to the large volume of production scrap flowing from mills, some part of which is being reconsumed without passing through the yards. No accurate estimates on what this volume is have been offered to date but it is believed considerable.

The 48-hr. week which has been made compulsory in some areas has met with little success in many of these areas as yards were already working upwards of 60-hr. per week before its establishment. This overtime had been found by hard-pressed yard operators to be one of the best methods of keeping workers away from attractive offers of war plants.

One section of the market reports that they feel that homes have been exhausted as a scrap source and hold only slight hopes for farms and obsolete machinery. Opposing these contentions, WPB has made it plain through recent estimates that homes could again contribute, although not so heavily, but farms and mills are expected to produce the bulk of this year's collections, in old machinery and parts. Auto graveyards although expected to decline in volume this year have been producing a sizable part of the total volume according to recent area reports. This volume will unquestionably dwindle later as jalopies headed for the scrap pile are decreasing in number.

Scrap men are beginning to form local associations for the purpose of adjusting yard wages on an area basis. Most recently formed is the Tri-State Scrap Yard Dealer's Assn. of the Pittsburgh area, who elected Samuel M. Goldberg of Pennsylvania Iron & Steel Co. as president, last week. The stated purpose of this group is to formulate and present to the WLB a wage adjustment proposal which will relieve the situation for member yards. Representatives of about 20 local yards attended the first meeting and election last Friday.

o o o

Scrap Consumption Hits Record Mark for February

• • • **Although consumption** of iron and steel scrap, both purchased and home, is estimated by the Institute of Scrap Iron and Steel Inc. for February at 4,361,000 gross tons compared with 4,753,000 tons in January, consumption on a daily average basis actually showed an increase. The February rate of consumption was the largest in history for that month and compares with 4,276,000 tons in February, 1942, and 4,172,000 tons in February, 1941.

•

Impounded Materials to Be Salvaged, Says Court

Philadelphia

• • • **A precedent for** disposal of impounded metals has been set by the U. S. District Court at Philadelphia, which recently released impounded food for fat salvage. Up to the present, impounded materials have either been destroyed or held unused for long periods of time.

Among Philadelphia scrap projects is an effort to get 85,000 tons of scrap from Pennsylvania farms before spring planting begins, a jalopy drive, a drive to salvage steel-shaft golf clubs for the chrome steel needed for surgical instruments, and a plan to take out the old pipe organs in movie theaters, silenced since films began to talk. There are 810 of these pipe organs, all containing considerable brass and aluminum, east of Harrisburg, Pa.

For the nine months prior to February, auto graveyards in Delaware, Maryland, eastern Pennsylvania, and Virginia moved 209,069 jalopies, yielding 156,802 tons of iron and steel scrap and 7217 tons of non-ferrous scrap. The current drive will continue throughout April.

•

Scrap Markets

CHICAGO—The scrap supply situation here continues on the improved plane reported last week and practically all consumers report that receipts of scrap for the week were at least equal to consumption. However, emphasis is still laid on the fact that the overall situation is far from comfortable and efforts to assure the continued flow of scrap must be intensified. The movement of farm scrap thus far this Spring has been disappointing.

•

ST. LOUIS—Mills in the district are complaining of the poor quality of much of the scrap reaching them, declaring that it is difficult to produce steel of the quality specified by the government. Efforts are being made to have allocations for higher grade material. Users of cast scrap are getting more than they need. Railroad offerings are lighter than for several weeks past.

•

BUFFALO—Advent of the compulsory 48-hr. week in the Buffalo district found virtually all scrapyards operating on a 60-hr. schedule. Little local scrap is

How One Scrap Dealer Views Today's Market

Philadelphia

• • • "What's new in the market this week?" asked the hopeful reporter for THE IRON AGE, interviewing the scrap dealer for the 897th consecutive week (or thereabouts).

"Look up Hebrews 13:8 and you have my answer," replied the dealer, who week after week has made brave attempts to freshen his reports, in the face of seldom-changing conditions.

The Biblical quotation seems to cover the situation very well indeed.

being received and no improvement is reported in the turnings jam. Mill reserves continue in fair shape.

•

CINCINNATI — Reflecting the easier situation in the district market, dealers report one of the local steel manufacturers to be out of the market on all items except No. 1 steel and No. 1 bundles. Report indicates that this concern has a large inventory and is sitting on the sidelines to see what developments occur. Other steel users, however, are taking all material offered and by and large all users of scrap are reported to be in good shape.

•

BOSTON — Yards in general report scrap coming in is rather light, particularly automobile scrap. Shipyards are supplying No. 1 steel in modest quantities, however. Turnings are moving satisfactorily, especially through broker's hands. Little textile scrap is available but there is some No. 1 machinery cast.
yards report insufficient labor to break up machinery cast, however.

•

BIRMINGHAM—Consumers in this district are showing a little more interest in the purchase of steel scrap although no large tonnages are yet involved. Accumulations on dealers yards continue to decrease.

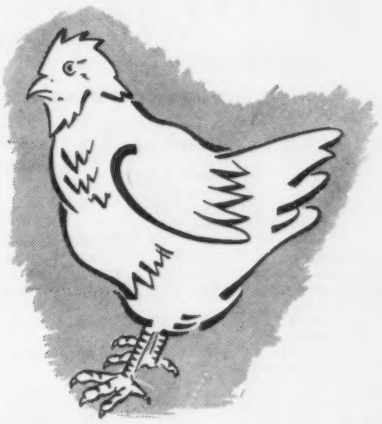
•

CLEVELAND—Mills in the Cleveland and Youngstown areas, which have been for the past few months in a relatively comfortable position for scrap, have suddenly found themselves with inventories of very low grade, inferior quality material on hand. This low grade scrap, stemming from the public scrap drives, is causing difficulties in charging and melting. Consequently, the scrap position in the two districts is not too comfortable.

•

PITTSBURGH — Scrap conditions are unchanged here from last week. The blowing out of some blast furnaces for repairs is expected to increase the demand for scrap.

How many FEATHERS in a Hen?



Our department of weights and standards, after plucking several specimens, has placed the problem back in our laps with no answer.

Many spring users have placed spring problems hard to solve in our hands to analyse and standardize. Scientific control of materials, close supervision of manufacture, automatic heat-treating, and accurate inspection and testing will give your springs a uniform degree of performance that eliminates kick-backs.

Buy springs that give known performance!

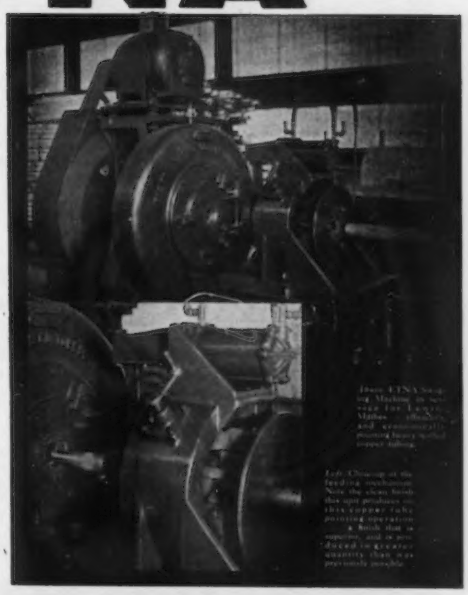
DUNBAR SPRINGMAKERS

SPRINGS WIRE FORMS SMALL STAMPINGS

DUNBAR BROS. CO., Bristol, Conn.
Division of Associated Spring Corporation

LEWIN-MATHES *Got the right answer at*

ETNA



They had a job of pointing heavy-walled copper tubing, and wanted to speed up the operation. Just how to do it didn't appear on the horizon, and so Lewin-Mathes did the safe and logical thing—they put their swaging job up to Etna.

The answer to that problem is illustrated on this page. It's a modern Etna Swaging Machine that points *more* copper tubes per hour in less time at less cost. If you have a problem involving tapering or reducing tubing and solid rounds—ask Etna about it.

Etna has the swaging machines from ⅜" to 4" and the experience to help you get the most out of this type of machine.

IF IT'S A QUESTION OF TAPERING, SIZING OR REDUCING OF ROUND SOLIDS OR TUBING... "Ask ETNA About Swaging"

ETNA MACHINE COMPANY
TOLEDO OHIO

IRON AND STEEL (OTHER THAN RAILROAD) SCRAP

(All Prices Are Per Gross Ton)

	BASIC OPEN HEARTH GRADES		BLAST FURNACE GRADES				ELECTRIC FURNACE, ACID OPEN HEARTH AND FOUNDRY GRADES									
							Low Phos.		Heavy Structural and Plate			Foundry Steel				
	No. 1 & 2 Hvy. Melt. No. 1 Cp. Blk. Shts. No. 1 & 2 Bundles No. 1 Busheling	Unbaled* Machine Shop Turnings	Mixed Borings and Turnings	Cast Iron Borings	Shovelling Turnings	No. 2 Busheling	Billet, Bloom, Forge Crops	Bar Crops, Punchings Plate Scrap and Cast Steel	3 ft. and Under	2 ft. and Under	1 ft. and Under	2 ft. and Under	1 ft. and Under	Auto. Springs, and Crankshafts	Alloy Free Low Phos. and Sulphur Turnings	Heavy Axle and Forge Turn. First Cut	Electric Furnace Bundles
Pittsburgh, Brackenridge, Butler, Monessen, Midland, Johnstown, Sharon, Canton, Steubenville, Warren, Youngstown, Weirton	$20.00	$15.00	$15.00	$16.00	$17.00	$17.50	$25.00	$22.50	$21.50	$22.00	$22.50	$21.50	$22.00	$21.00	$18.00	$19.50	$21.00
Cleveland, Middletown, Cincinnati, Portsmouth	19.50	14.50	14.50	15.50	16.50	17.00	24.50	22.00	21.00	21.50	22.00	21.00	21.50	20.50	17.50	19.00	20.50
Chicago, Claymont, Coatesville, Conshohocken, Harrisburg, Phoenixville, Sparrows Point	18.75	13.75	13.75	14.75	15.75	16.25	23.75	21.25	20.25	20.75	21.25	20.25	20.75	19.75	16.75	18.25	19.75
Ashland, Ky.	19.50	14.50	14.50	15.50	16.50	17.00	24.50	22.00	21.00	21.50	22.00	21.00	21.50	20.50	17.50	19.00	20.50
Buffalo, N. Y.	19.25	14.25	14.25	15.25	16.25	16.75	24.25	21.75	20.75	21.25	21.75	20.75	21.25	20.25	17.25	18.75	20.25
Bethlehem, Pa.; Kokomo, Ind.	18.25	13.25	13.25	14.25	15.25	15.75	23.25	20.75	19.75	20.25	20.75	19.75	20.25	19.25	16.25	17.75	19.25
Duluth, Minn.	18.00	13.00	13.00	14.00	15.00	15.50	23.00	20.50	19.50	20.00	20.50	19.50	20.00	19.00	16.00	17.50	19.00
Detroit, Mich.	17.85	12.85	12.85	13.85	14.85	15.35	22.85	20.35	19.35	19.85	20.35	19.35	19.85	18.85	15.85	17.35	18.85
Toledo, Ohio	.....	12.85	12.85	13.85	14.85	15.35	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Louis, Mo.	17.50	12.50	12.50	13.50	14.50	15.00	22.50	20.00	19.00	19.50	20.00	19.00	19.50	18.50	15.50	17.00	18.50
Atlanta, Ga.; Alabama City, Ala.; Birmingham, Los Angeles; Pittsburg, Cal.; San Francisco	17.00	12.00	12.00	13.00	14.00	14.50	22.00	19.50	18.50	19.00	19.50	18.50	19.00	18.00	15.00	16.50	18.00
Minnequa, Colo.	16.50	11.50	11.50	12.50	13.50	14.00	21.50	19.00	18.00	18.50	19.00	18.00	18.50	17.50	14.50	16.00	17.50
Seattle, Wash.	14.50	9.50	9.50	10.50	11.50	12.00	19.50	17.00	16.00	16.50	17.00	16.00	16.00	15.00	12.50	14.00	15.50

* Baled turnings are $5 per gross ton higher.

BUNDLES: Tin can bundles are $4 below dealers' No. 2 bundles No. 3 bundles are $2 less than No. 1 heavy melting.

AT NEW YORK city or Brooklyn, the maximum shipping point price is $15.33 for No. 1 heavy melting, f.o.b. cars, f.a.s. vessel or loaded on truck. Other grades carry differentials similar to those in table. New Jersey prices must be computed on basis of all-rail. At Boston the maximum is $15.05 for No. 1 f.o.b. cars, f.a.s. vessel or loaded on trucks. Shipments from a New England shipping point to a consumer outside New England carry maximum transportation charge of $6.66 per ton.

SWITCHING CHARGES: Deductions for shipping points within basing points (cents per gross ton) are: Pittsburgh, Brackenridge, 55c.; Midland, Johnstown, Sharon, Youngstown, Warren, Weirton, Cleveland, Toledo, Los Angeles, San Francisco, 42c.; Butler, Monessen, Canton, Steubenville, Cincinnati*, Portsmouth, Ashland, Coatesville, Harrisburg, Phoenixville, Bethlehem, Kokomo, Duluth, St. Louis, 28c.; Buffalo, Claymont, 36c.; Conshohocken, 11c.; Atlanta, Birmingham, 32c.; Pittsburg, Cal., 42c.; Middletown, 14c.; Sparrow's Point, 11c.; Chicago, 84c.; Detroit, 53c.; Alabama City, 26c.; Minnequa, 22c.; Seattle, 38c. *At Cincinnati, for basic open hearth grades, foundry steel and auto springs and crankshafts, deduct 80c. per ton.

PITTSBURGH basing point includes switching districts of Bessemer, Homestead, Duquesne, Munhall and McKeesport, Cincinnati basing point includes Newport, Ky., switching district. St. Louis ineludes switching districts of Granite City, East St. Louis, Madison, Ill. San Francisco includes switching districts of S. San Francisco, Niles and Oakland, Cal.

MAXIMUM prices of inferior grades shall continue to bear same differential below corresponding grades as existed during the period Sept. 1, 1940, to Jan. 31, 1941. Superior grades cannot be sold at a premium without approval of OPA. Special preparation charges in excess of the above prices are banned. Whenever any electric furnace or foundry grades are purchased for open hearth or blast furnace use, prices may not exceed the prices above for the crresponding open hearth grades.

MAXIMUM SHIPPING POINT PRICE—Where shipment is by rail or vessel, or by combination of rail and vessel, the scrap is at its shipping point when placed f.o.b. railroad or f.a.s. vessel. In such cases, the maximum shipping point prices shall be: (a) For shipping points located within a basing point, the price listed in the table above for the scrap at the basing point in which the shipping point is located, minus the lowest established switching charge for scrap within the basing point and (b) for shipping points located outside the basing point, the price in table above at the most favorable basing point minus the lowest transportation charge by rail or water or combination thereof. In lieu of dock charge add 75c. a ton*, but 50c. if moved by deck scow or railroad lighter. Shipping by motor vehicle: The scrap is at its shipping point when loaded. For shipping points located within basing points take price listed in table minus applicable switching charge. If located outside a basing point, the price at the most favorable basing point minus lowest established charge for transporting by common carrier. If no established transportation rate exists, the customary costs are deducted. Published dock charges prevail. If unpublished include 75c.* For exceptions see official order.

UNPREPARED SCRAP: For unprepared scrap, maximum prices shall be $3.50 (and in the case of the material from which No. 1, No. 2, and No. 3 bundles are made $4) less maximum prices for the corresponding grade or grades of prepared scrap. In no case, however, shall electric furnace and foundry grades be used as the "corresponding grade or grades of prepared scrap." Converter may charge $2.50 per ton on consumer-owned unprepared remote scrap (see order). A preparation-in-transit charge for allocated unprepared scrap is provided.

Maximum price of all scrap in a vehicle is that of the lowest price grade in the shipment. This limitation does not apply to vessel shipments if grades are segregated.

Where scrap is to undergo preparation prior to its arrival at the point of delivery, such scrap is not at its shipping point, as that phrase is defined above, until after preparation has been completed. For special preparation charges, consult official order.

CHEMICAL BORINGS: No. 1 (new, clean, containing not more than 1 per cent oil), $1 less than No. 1 heavy melting; No. 2 (new, clean, containing not more than 1.5 per cent oil), $2 less than No. 1 heavy melting. If loaded in box cars add 75c.

UNPREPARED CAST IRON SCRAP—Except for heavy breakable cast, unprepared scrap is given a price ceiling of $2.50 per ton less than the maximum prices for the corresponding grade of prepared cast iron scrap. Where scrap is to undergo preparation prior to arrival at the point of delivery, such scrap is not considered at shipping point until preparation is completed.

Consumers of cast scrap may pay the shipping point price plus established charge for transporting the scrap to their planes. In the case of deliveries by truck, the cast scrap buyer must obtain from the seller a certification, made out to OPA.

*At Memphis 50c.; Great Lakes ports $1; New England $1.25.

RAILROAD SCRAP

	No. 1 RR Heavy Melting	Scrap Rails	Rails for Rerolling	Scrap Rails: 3 ft. and Under	Scrap Rails: 2 ft. and Under	Scrap Rails: 18 in. and Under
Cleveland, Cincinnati, Ashland, Portsmouth, Middletown	$20.50	$21.50	$23.00	$23.50	$23.75	$24.00
Canton, Pittsburgh, Sharon, Steubenville, Wheeling, Youngstown	21.00	22.00	23.50	24.00	24.25	24.50
Chicago, Philadelphia, Sparrows Pt., Wilmington	19.75	20.75	22.25	22.75	23.00	23.25
Birmingham, Los Angeles, San Francisco	18.00	19.00	20.50	21.00	21.25	21.50
Buffalo	20.25	21.25	22.75	23.25	23.50	23.75
Detroit	18.85	19.85	21.35	21.85	22.10	22.35
Duluth	19.00	20.00	21.50	22.00	22.25	22.50
Kansas City, Mo.	17.00	18.00	19.50	20.00	20.25	20.50
Kokomo, Ind.	19.25	20.25	21.75	22.25	22.50	22.75
Seattle	15.50	16.50	18.00	18.50	18.75	19.00
St. Louis	18.50	19.50	21.00	21.50	21.75	22.00

CAST IRON SCRAP

	Group A	Group B	Group C
No. 1 cupola cast	$18.00	$19.00	$20.00
Clean auto cast	18.00	19.00	20.00
Unstripped motor blocks	15.50	16.50	17.50
Stove Plate	17.00	18.00	19.00
Heavy Breakable Cast	15.50	16.50	17.50
Charging Box Size Cast	17.00	18.00	19.00
Misc. Malleable	20.00	21.00	22.00

Group A includes the states of Montana, Idaho, Wyoming, Nevada, Utah, Arizona and New Mexico.

Group B includes the states of North Dakota, South Dakota, Nebraska, Colorado, Kansas, Oklahoma, Texas and Florida.

Group C: States not named in A and B; switching district of Kansas City, Kan., Mo.

. . . Comparison of Prices

Advances Over Past Week in **Heavy Type**; Declines in *Italics*. [Prices Are F.O.B. Major Basing Points]

Flat Rolled Steel: (Cents Per Lb.)	Apr. 6, 1943	Mar. 30, 1943	Mar. 9, 1943	Apr. 7, 1942
Hot rolled sheets	2.10	2.10	2.10	2.10
Cold rolled sheets	3.05	3.05	3.05	3.05
Galvanized sheets (24 ga.)	3.50	3.50	3.50	3.50
Hot rolled strip	2.10	2.10	2.10	2.10
Cold rolled strip	2.80	2.80	2.80	2.80
Plates	2.10	2.10	2.10	2.10
Plates, wrought iron	3.80	3.80	3.80	3.80
Stain's c.r. strip (No. 302)	28.00	28.00	28.00	28.00
Tin and Terne Plate: (Dollars Per Base Box)				
Tin plate, standard cokes	$5.00	$5.00	$5.00	$5.00
Tin plate, electrolytic	4.50	4.50	4.50	4.50
Special coated mfg. ternes	4.30	4.30	4.30	4.30
Bars and Shapes: (Cents Per Lb.)				
Merchant bars	2.15	2.15	2.15	2.15
Cold finished bars	2.65	2.65	2.65	2.65
Alloy bars	2.70	2.70	2.70	2.70
Structural shapes	2.10	2.10	2.10	2.10
Stainless bars (No. 302)	24.00	24.00	24.00	24.00
Wrought iron bars	4.40	4.40	4.40	4.40
Wire and Wire Products: (Cents Per Lb.)				
Plain wire	2.60	2.60	2.60	2.60
Wire nails	2.55	2.55	2.55	2.55
Rails: (Dollars Per Gross Ton)				
Heavy rails	$40.00	$40.00	$40.00	$40.00
Light rails	40.00	40.00	40.00	40.00
Semi-Finished Steel: (Dollars Per Gross Ton)				
Rerolling billets	$34.00	$34.00	$34.00	$34.00
Sheet bars	34.00	34.00	34.00	34.00
Slabs	34.00	34.00	34.00	34.00
Forging billets	40.00	40.00	40.00	40.00
Alloy blooms, billets, slabs	54.00	54.00	54.00	54.00
Wire Rods and Skelp: (Cents Per Lb.)				
Wire rods	2.00	2.00	2.00	2.00
Skelp (grvd)	1.90	1.90	1.90	1.90

Pig Iron: (Per Gross Ton)	Apr. 6, 1943	Mar. 30, 1943	Mar. 9, 1943	Apr. 7, 1942
No. 2 fdy., Philadelphia	$25.89	$25.89	$25.89	$25.89
No. 2, Valley furnace	24.00	24.00	24.00	24.00
No. 2, Southern Cin'ti	24.68	24.68	24.68	24.68
No. 2, Birmingham	20.38	20.38	20.38	20.38
No. 2, foundry, Chicago†	24.00	24.00	24.00	24.00
Basic, del'd eastern Pa.	25.39	25.39	25.39	25.39
Basic, Valley furnace	23.50	23.50	23.50	23.50
Malleable, Chicago†	24.00	24.00	24.00	24.00
Malleable, Valley	24.00	24.00	24.00	24.00
L. S. charcoal, Chicago	31.34	31.34	31.34	31.34
Ferromanganese‡	135.00	135.00	135.00	120.00

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.
‡For carlots at seaboard.

Scrap: (Per Gross Ton)				
Heavy melt'g steel, P'gh.	$20.00	$20.00	$20.00	$20.00
Heavy melt'g steel, Phila.	18.75	18.75	18.75	18.75
Heavy melt'g steel, Ch'go	18.75	18.75	18.75	18.75
No. 1 hy. comp. sheet, Det.	17.85	17.85	17.85	17.85
Low phos. plate, Youngs'n	22.50	22.50	22.50	23.00
No. 1 cast, Pittsburgh	20.00	20.00	20.00	20.00
No. 1 cast, Philadelphia	20.00	20.00	20.00	20.00
No. 1 cast, Ch'go	20.00	20.00	20.00	20.00
Coke, Connellsville: (Per Net Ton at Oven)				
Furnace coke, prompt	$6.50	$6.50	$6.50	$6.00
Foundry coke, prompt	7.375	7.375	6.875	6.875
Non-Ferrous Metals: (Cents per Lb. to Large Buyers)				
Copper, electro., Conn.	12.00	12.00	12.00	12.00
Copper, Lake, New York	12.00	12.00	12.00	12.00
Tin (Straits), New York	52.00	52.00	52.00	52.00
Zinc, East St. Louis	8.25	8.25	8.25	8.25
Lead, St. Louis	6.35	6.35	6.35	6.35
Aluminum, Virgin, del'd.	15.00	15.00	15.00	15.00
Nickel, electrolytic	35.00	35.00	35.00	35.00
Magnesium, ingot	20.50	20.50	20.50	22.50
Antimony (Asiatic), N. Y.	16.50	16.50	16.50	16.50

The various basing points for finished and semi-finished steel are listed in the detailed price tables, pages 162 to 168.

Composite Prices . . .

	FINISHED STEEL	PIG IRON	SCRAP STEEL
Apr. 6, 1943	2.30467c. a Lb.	23.61 a Gross Ton	$19.17 a Gross Ton
One week ago	2.30467c. a Lb.	23.61 a Gross Ton	$19.17 a Gross Ton
One month ago	2.30467c. a Lb.	23.61 a Gross Ton	$19.17 a Gross Ton
One year ago	2.30467c. a Lb.	23.61 a Gross Ton	$19.17 a Gross Ton

	FINISHED STEEL HIGH	FINISHED STEEL LOW	PIG IRON HIGH	PIG IRON LOW	SCRAP STEEL HIGH	SCRAP STEEL LOW
1943	2.30467c.,	2.30467c.,	$23.61	$23.61	$19.17	$19.17
1942	2.30467c.,	2.30467c.,	23.61	23.61	19.17	19.17
1941	2.30467c.,	2.30467c.,	$23.61, Mar. 20	$23.45, Jan. 2	$22.00, Jan. 7	$19.17, Apr. 10
1940	2.30467c., Jan. 2	2.24107c., Apr. 16	23.45, Dec. 23	22.61, Jan. 2	21.83, Dec. 30	16.04, Apr. 9
1939	2.35367c., Jan. 3	2.26689c., May 16	22.61, Sept. 19	20.61, Sept. 12	22.50, Oct. 3	14.08, May 16
1938	2.58414c., Jan. 4	2.27207c., Oct. 18	23.25, June 21	19.61, July 6	15.00, Nov. 22	11.00, June 7
1937	2.58414c., Mar. 9	2.32263c., Jan. 4	23.25, Mar. 9	20.25, Feb. 16	21.92, Mar. 30	12.67, June 9
1936	2.32263c., Dec. 28	2.05200c., Mar. 10	19.74, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9
1935	2.07642c., Oct. 1	2.06492c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, Apr. 29
1934	2.15367c., Apr. 24	1.95757c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	1.95578c., Oct. 3	1.75836c., May 2	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.89196c., July 5	1.83901c., Mar. 1	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	1.99626c., Jan. 13	1.86586c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.25488c., Jan. 7	1.97319c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.31773c., May 28	2.26498c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3

Weighted index based on steel bars, beams, tank plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 per cent of the United States output. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Prices of Finished Iron and Steel . . .

Steel prices shown here are f.o.b. basing points, in cents per lb., unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, reductions, and in most cases freight absorbed to meet competition. Delivered prices do not reflect new 3 per cent tax on freight rates.

Basing Point → / Product ↓	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio	Gulf Ports, Cars	Pacific Ports, Cars[10]	DELIVERED TO Detroit	New York	Philadelphia
SHEETS															
Hot rolled	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.20¢	2.10¢		2.65¢	2.22¢	2.35¢	2.28¢
Cold rolled[1]	3.05¢	3.05¢	3.05¢	3.05¢		3.05¢	3.05¢		3.15¢	3.05¢		3.70¢	3.17¢	3.41¢	3.39¢
Galvanized (24 ga.)	3.50¢	3.50¢	3.50¢		3.50¢	3.50¢	3.50¢	3.50¢	3.60¢	3.50¢		4.05¢		3.75¢	3.68¢
Enameling (20 ga.)	3.35¢	3.35¢	3.35¢	3.35¢			3.35¢		3.45¢	3.35¢		4.00¢	3.47¢	3.73¢	3.69¢
Long ternes[2]	3.80¢		3.80¢									4.55¢		4.18¢	4.14¢
STRIP															
Hot rolled[3]	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢			2.10¢		2.75¢	2.22¢	2.48¢	
Cold rolled[4]	2.80¢	2.90¢		2.80¢			2.80¢	(Worcester = 3.00¢)					2.92¢	3.18¢	
Cooperage stock	2.20¢	2.20¢			2.20¢		2.20¢							2.58¢	
Commodity C-R	2.95¢			2.95¢			2.95¢	(Worcester = 3.35¢)					3.07¢	3.33¢	
TIN MILL PRODUCTS															
Coke tin plate, base box	$5.00	$5.00	$5.00						$5.10					5.38¢	5.34¢
Electrolytic tin plate, box	$4.50		$4.50												
Black plate, 29 gage[5]	3.05¢	3.05¢	3.05¢						3.15¢			4.05¢[12]			3.39¢
Mfg. ternes, special box	$4.30	$4.30	$4.30						$4.40						
BARS															
Carbon steel	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢		(Duluth = 2.25¢)			2.52¢	2.80¢	2.27¢	2.51¢	2.49¢
Rail steel[6]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢					2.52¢	2.80¢			
Reinforcing (billet)[7]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.52¢	2.55¢[13]	2.27¢	2.40¢	
Reinforcing (rail)[7]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢				2.52¢	2.55¢[13]	2.27¢		2.49¢
Cold finished[8]	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢			(Detroit = 2.70¢)					3.01¢	2.99¢
Alloy, hot rolled	2.70¢	2.70¢				2.70¢	(Bethlehem, Massillon, Canton = 2.70¢)						2.82¢		
Alloy, cold drawn	3.35¢	3.35¢	3.35¢	3.35¢		3.35¢							3.47¢		
								(Coatesville and Claymont = 2.10¢)							
PLATES															
Carbon steel	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢	2.25¢[11]		2.47¢	2.65¢	2.33¢	2.30¢	2.15¢
Floor plates	3.35¢	3.35¢									3.72¢	4.00¢		3.73¢	3.69¢
Alloy	3.50¢	3.50¢			(Coatesville = 3.50¢)						3.97¢	4.15¢		3.71¢	3.60¢
SHAPES															
Structural	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢	(Bethlehem = 2.10¢)				2.47¢	2.75¢		2.28¢	2.22¢
SPRING STEEL, C-R															
0.26 to 0.50 Carbon	2.80¢			2.80¢			(Worcester = 3.00¢)								
0.51 to 0.75 Carbon	4.30¢			4.30¢			(Worcester = 4.50¢)								
0.76 to 1.00 Carbon	6.15¢			6.15¢			(Worcester = 6.35¢)								
1.01 to 1.25 Carbon	8.35¢			8.35¢			(Worcester = 8.55¢)								
WIRE[9]															
Bright[15]	2.60¢	2.60¢		2.60¢	2.60¢		(Worcester = 2.70¢)					3.10¢			2.94¢
Galvanized	add proper size extra and galvanized extra to bright wire base, above.														
Spring (High Carbon)	3.20¢	3.20¢		3.20¢			(Worcester = 3.30¢)					3.70¢			3.54¢
PILING															
Steel sheet	2.40¢	2.40¢				2.40¢						2.95¢			2.74¢

[1] Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base. [2] Unassorted 8-lb. coating. [3] Widths up to 12 in. [4] Carbon 0.25 per cent and less. [5] Applies to certain width and length limitations. [6] For merchant trade. [7] Prices for straight length material only, from a producer to a consumer. Functional discount of 25c. per 100 lb. to fabricators. [8] Also shafting. For quantities of 20,000 to 39,999 lb. [9] Carload lot to manufacturing trade. [10] These prices do not apply if the customary means of transportation (rail and water) are not used. [11] Ship plates only. [12] Boxed. [13] Portland and Seattle price, San Francisco price is 2.50c. [14] This bright wire base price to be used in figuring annealed and bright finish wires, commercial spring wire and galvanized wire.

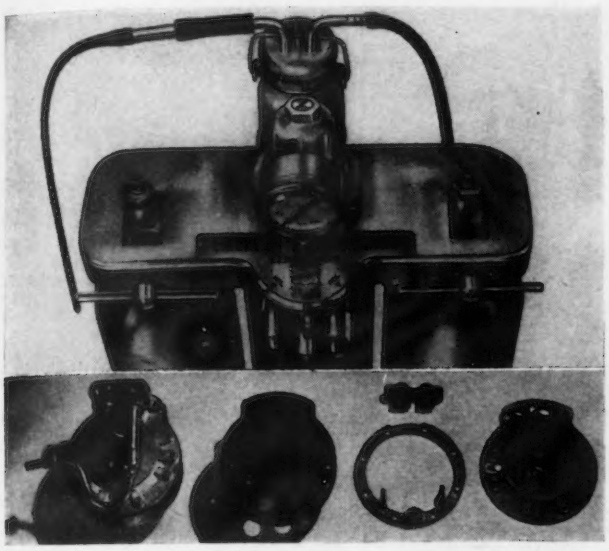
GOVERNMENT CEILINGS—Price Schedule No. 6 issued April 16, 1941, governs steel mill prices; Price Schedule No. 49 governs warehouse prices, which are on another page of this issue.

EXCEPTIONS TO PRICE SCHEDULE No. 6—On hot rolled carbon bars, Phoenix Iron Co. may quote 2.35c. at established basing points, Calumet Steel division of Borg Warner may quote 2.35c., Chicago, on bars from its 8-in. mill; Joslyn Mfg. Co. may quote 2.35c., Chicago base. On rail steel bars Sweets Steel Co. may quote 2.35c., f.o.b. mill. On hot rolled sheets, Andrews Steel Co. may quote for shipment to Detroit area on Middletown base. On galvanized sheets, Andrews Steel may quote 3.75c., at established basing points. On hot rolled strip, Joslyn Mfg. Co. may quote 2.30c., Chicago base. On plates, Granite City Steel Co. may quote 2.35c., f.o.b. mill, and Central Iron & Steel Co. may quote 2.20c., f.o.b. basing points. On shapes, Phoenix Iron Co. may quote 2.30c. established basing points and 2.50c. Phoenixville for export.

On rail steel merchant bars, Eckels-Nye Corp. may charge 2.40c. On tubing, South Chester Tube Co. may price Gulf or Pacific Coast all-rail shipments and shipments west of Harrisburg on basis of f.o.b. Chester. On lend-lease sales to eastern seaboard, Sheffield Steel Co. and Colorado Fuel & Iron Corp. may sell f.o.b. mill. SEMIFINISHED STEEL—Follansbee Steel Corp. may sell forging billets at $49.50 f.o.b. Toronto; Continental Steel Corp. may sell Acme Steel Co. at $34 for rerolling billets plus extras and freight; Ford Motor Co. may sell rerolling billets at $34 f.o.b. Dearborn; Andrews Steel Co. may sell forging billets at $50 at established basing points and slabs at $41; Empire Sheet and Tin Plate may sell slabs at $41 at established basing points and sheet bars at $39 f.o.b. mill; on lend-lease sales Northwestern Steel & Wire Co. may charge $41 per gross ton f.o.b. mill for rerolling billets; on lend-lease sales Wheeling Steel Corp. may charge $36 per ton for small billets, f.o.b. Portsmouth and $37 per ton for sheet bars f.o.b. Portsmouth; Laclede Steel Co. on semifinished sales for lend-lease shipped to eastern seaboard may use Chicago basing point prices f.o.b. Alton and Madison, Ill. ALLOY STEEL BARS—Texas Steel Co. may use Chicago base f.o.b. Fort Worth.

FOR WAR TODAY—FOR YOUR PRODUCTS TOMORROW

A DIE CAST HEART FOR MECHANICAL LUNGS



A resuscitator and its die cast heart assembly

Each of the many models of resuscitation units produced by a prominent manufacturer is equipped with an assembly of four zinc alloy die castings which constitute the "heart" of the breathing mechanism.

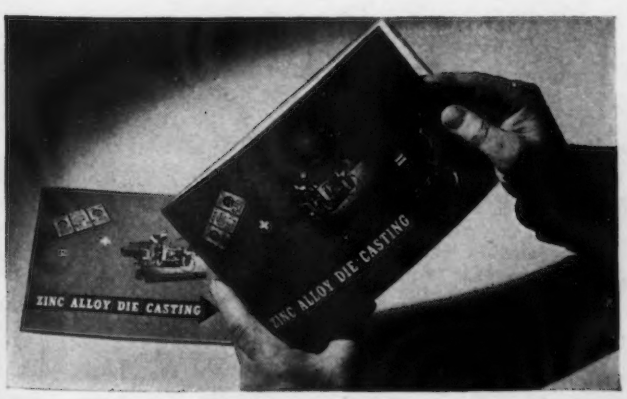
These castings, illustrated above, have a number of advantages over parts produced by other means. Their dimensional accuracy assures a "tight" assembly, they are complex in design to minimize machining and assembling costs, and they are tough enough to take abnormal abuse.

The latter point is important when one considers that these mechanical lungs are now seeing service with our armed forces in the field, as well as in civilian hospitals. The particular unit shown above can be converted — by a simple adjustment — into a resuscitator, an aspirator (drawing off throat secretions) or an inhalator.

QUESTIONS & ANSWERS ON DIE CASTINGS

What is a die casting? What is the rate of production in die casting? What shapes are possible in die casting? Is the die casting process applicable only to mass production?

If you want the answers to these questions, or if you have other questions on the subject of die castings, write for a copy of the booklet "Zinc Alloy Die Casting," just off the press.



Send for your copy now

THE New Jersey zinc° ALLOY POT

A publication issued for many years by The New Jersey Zinc Company to report on trends and accomplishments in the field of die castings. Title Reg. U. S. Pat. Off.

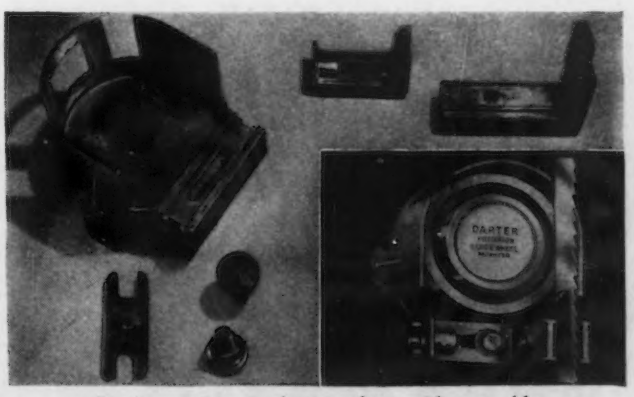
IRON AGE EDITION **No. 8**

ALL-DIE CAST BAND SAW GUIDE

The versatility of zinc alloy die castings is clearly illustrated in the band saw guide assembly shown below. Everything is die cast except the guide wheel and a few screws. The manufacturer says:

"The design is such that had this been made in the usual way from rough castings and machined, the cost would have been prohibitive and the assembly would have been heavy and cumbersome. By die casting these parts the guide is very compact and very strong, but accurate for the work it has to do."

This guide can be assembled either right or left hand for use on any band saw above or below the table. It will operate on saws with a blade speed up to two or three miles per minute. A wide variety of war work is now being turned out with the use of this guide in shipyards, aircraft plants and other war industries.



Six die castings in the complete guide assembly

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK CITY
HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC

SEMI-FINISHED STEEL

For exceptions, see preceding page

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (rerolling only). Prices delivered Detroit are $2.25 higher; f.o.b. Duluth, billets only, $2 higher. Delivered prices do not reflect new per cent tax on freight rates.

	Per Gross Ton
Rerolling	$34.00
Forging quality	40.00
Alloy Steel: Pittsburgh, Chicago, Canton, Massillon, Buffalo, or Bethlehem, per gross ton	$54.00

Shell Steel

	Per Gross Ton
3 in. to 12 in.	$52.00
12 in. to 18 in.	54.00
18 in. and over	56.00

Basic open hearth shell steel, f.o.b. Pittsburgh, Chicago, Buffalo, Gary, Cleveland, Youngstown and Birmingham.

Prices delivered Detroit are $2.25 higher.

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting, or quantity.

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open hearth or bessemer	$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	1.90c.

Wire Rods

(No. 5 to 9/32 in.)

	Per Lb.
Pittsburgh, Chicago, Cleveland	2.00c.
Worcester, Mass.	2.10c.
Birmingham	2.00c.
San Francisco	2.50c.
Galveston	2.25c.

9/32 in. to 47/64 in., 0.15c. a lb. higher. Quantity extras apply.

TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse)

	Base per lb.
High speed	67c.
Straight molybdenum	54c.
Tungsten-molybdenum	57½c.
High-carbon-chromium	43c.
Oil hardening	24c.
Special carbon	22c.
Extra carbon	18c.
Regular carbon	14c.

Warehouse prices east of Mississippi are 2c. a lb. higher; west of Mississippi, 3c. higher.

CORROSION AND HEAT-RESISTING STEEL

(Per lb. base price, f.o.b. Pittsburgh)

Chromium-Nickel Alloys

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25.00c.	24.00c.
Plates	29.00c.	27.00c.
Structural shapes	25.00c.	24.00c.
Sheets	36.00c.	34.00c.
Hot rolled strip	23.50c.	21.50c.
Cold rolled strip	30.00c.	28.00c.
Drawn wire	25.00c.	24.00c.

Straight-Chromium Alloys

	No. 410	No. 430	No. 442	No. 446
F.Billets	15.725c.	16.15c.	19.125c.	23.375c.
Bars	18.50c.	19.00c.	22.50c.	27.50c.
Plates	21.50c.	22.00c.	25.50c.	30.50c.
Sheets	26.50c.	29.00c.	32.50c.	36.50c.
Hotstrip	17.00c.	17.50c.	24.00c.	35.00c.
Cold st.	22.00c.	22.50c.	32.00c.	52.00c.

Chromium-Nickel Clad Steel (20%)

	No. 304
Plates	18.00c.*
Sheets	19.00c.

*Includes annealing and pickling.

N. E. STEELS (Hot Rolled) Extras for Alloy Content

Designation	CHEMICAL COMPOSITION LIMITS, PER CENT								Basic Open-Hearth		Electric Furnace	
	Carbon	Manganese	Phosphorus Max.	Sulphur Max.	Silicon	Chromium	Nickel	Molybdenum	Bars and Bar Strip	Billets, Blooms and Slabs	Bars and Bar Strip	Billets, Blooms and Slabs
NE 1330	.28/ .33	1.60/1.90	.040	.040	.20/ .35				.10c	$2.00		
NE 1335	.33/ .38	1.60/1.90	.040	.040	.20/ .35				.10	2.00		
NE 1340	.38/ .43	1.60/1.90	.040	.040	.20/ .35				.10	2.00		
NE 1345	.43/ .48	1.60/1.90	.040	.040	.20/ .35				.10	2.00		
NE 1350	.48/ .53	1.60/1.90	.040	.040	.20/ .35				.10	2.00		
NE 8020	.18/ .23	1.00/1.30	.040	.040	.20/ .35			.10/ .20	.45	9.00	.95c	$19.00
NE 8442*	.40/ .45	1.30/1.60	.040	.040	.20/ .35			.30/ .40	.90	18.00	1.40	28.00
NE 8613	.12/ .17	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8615	.13/ .18	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8617	.15/ .20	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8620	.18/ .23	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8630	.28/ .33	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8635	.33/ .38	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8637	.35/ .40	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8640	.38/ .43	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8642	.40/ .45	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8645	.43/ .48	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8650	.48/ .53	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8720	.18/ .23	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.20/ .30	.80	16.00	1.30	26.00
NE 9255	.50/ .60	.70/ .95	.040	.040	1.80/2.20				.40c	8.00		
NE 9260	.55/ .65	.75/1.00	.040	.040	1.80/2.20				.40	8.00		
NE 9262	.55/ .65	.75/1.00	.040	.040	1.80/2.20	.20/ .40			.65	13.00		
NE 9415	.13/ .18	.80/1.10	.040	.040	.40/ .60	.20/ .40	.20/ .50	.08/ .15	.80	16.00	1.30c	$26.00
NE 9420	.18/ .23	.80/1.10	.040	.040	.40/ .60	.20/ .40	.20/ .50	.08/ .15	.80	16.00	1.30	26.00
NE 9422	.20/ .25	.80/1.10	.040	.040	.40/ .60	.20/ .40	.20/ .50	.08/ .15	.80	16.00	1.30	26.00
NE 9430	.28/ .33	.90/1.20	.040	.040	.40/ .60	.20/ .40	.20/ .50	.08/ .15	.80	16.00	1.30	26.00
NE 9435	.33/ .38	.90/1.20	.040	.040	.40/ .60	.20/ .40	.20/ .50	.08/ .15	.80	16.00	1.30	26.00
NE 9437	.35/ .40	.90/1.20	.040	.040	.40/ .60	.20/ .40	.20/ .50	.08/ .15	.80	16.00	1.30	26.00
NE 9440	.38/ .43	.90/1.20	.040	.040	.40/ .60	.20/ .40	.20/ .50	.08/ .15	.80	16.00	1.30	26.00
NE 9442	.40/ .45	1.00/1.30	.040	.040	.40/ .60	.20/ .40	.20/ .50	.08/ .15	.85	17.00	1.35	27.00
NE 9445	.43/ .48	1.00/1.30	.040	.040	.40/ .60	.20/ .40	.20/ .50	.08/ .15	.85	17.00	1.35	27.00
NE 9450	.48/ .53	1.20/1.50	.040	.040	.40/ .60	.20/ .40	.20/ .50	.08/ .15	.85	17.00	1.35	27.00
NE 9537*	.35/ .40	1.20/1.50	.040	.040	.40/ .60	.40/ .60	.40/ .70	.15/ .25	1.20	24.00	1.70	34.00
NE 9540*	.38/ .43	1.20/1.50	.040	.040	.40/ .60	.40/ .60	.40/ .70	.15/ .25	1.20	24.00	1.70	34.00
NE 9542*	.40/ .45	1.20/1.50	.040	.040	.40/ .60	.40/ .60	.40/ .70	.15/ .25	1.20	24.00	1.70	34.00
NE 9550*	.48/ .53	1.20/1.50	.040	.040	.40/ .60	.40/ .60	.40/ .70	.15/ .25	1.20	24.00	1.70	34.00
NE 9630	.28/ .33	1.20/1.50	.040	.040	.40/ .60	.40/ .60			.80	16.00	1.30	26.00
NE 9635	.33/ .38	1.20/1.50	.040	.040	.40/ .60	.40/ .60			.80	16.00	1.30	26.00
NE 9637	.35/ .40	1.20/1.50	.040	.040	.40/ .60	.40/ .60			.80	16.00	1.30	26.00
NE 9640	.38/ .43	1.20/1.50	.040	.040	.40/ .60	.40/ .60			.80	16.00	1.30	26.00
NE 9642	.40/ .45	1.30/1.60	.040	.040	.40/ .60	.40/ .60			.85	17.00	1.35	27.00
NE 9645	.43/ .48	1.30/1.60	.040	.040	.40/ .60	.40/ .60			.85	17.00	1.35	27.00
NE 9650	.48/ .53	1.30/1.60	.040	.040	.40/ .60	.40/ .60			.85	17.00	1.35	27.00

***Recommended for large sections only. Note: The extras shown above are in addition to a base price of 2.70c. per 100 lb., on finished products and $54 per gross ton on semi-finished steel major basing points and are in cents per 100 lb. and dollars per gross ton in semi-finished. When acid open-hearth is specified and acceptable add to basic open hearth alloy differential 0.25c. per lb. for bars and bar strip, $5.00 per gross ton for billets, blooms and slabs. The ranges shown above are restricted to sizes 100 sq. in. or less or equivalent cross sectional area 18 in. wide or under with a max. individual piece weight of 7000 lb.**

ELECTRICAL SHEETS

(Base, f.o.b. Pittsburgh)

	Per Lb.
Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Motor	4.95c.
Dynamo	5.65c.
Transformer 72	6.15c.
Transformer 65	7.15c.
Transformer 58	7.65c.
Transformer 52	8.45c.

F.o.b. Granite City, add 10c. per 100 lb. on field grade to and including dynamo. Pacific ports add 75c. per 100 lb. on all grades.

WIRE PRODUCTS

To the trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham

	Base per Keg
Standard wire nails	$2.55
Coated nails	2.55
Cutnails, carloads	3.85
	Base per 100 Lb.
Annealed fence wire	$3.05
Annealed galvanized fence wire	3.40
	Base Column
Woven wire fence*	67
Fence posts (carloads)	69
Single loop bale ties	59
Galvanized barbed wire†	70
Twisted barbless wire	70

*15½ gage and heavier. †On 80-rod spools in carload quantities.

RAILS, TRACK SUPPLIES

(F.o.b. Mill)

Standard rails, heavier than 60 lb., gross ton	$40.00
Angle bars, 100 lb.	2.70
(F.o.b. Basing Points)	*Per Gross Ton*
Light rails (from billets)	$40.00
Light rails (from rail steel)	39.00
	Base per Lb.
Cut spikes	3.00c.
Screw spikes	5.15c.
Tie plates, steel	2.15c.
Tie plates, Pacific Coast	2.30c.
Track bolts	4.75c.
Track bolts, heat treated, to railroads	5.00c.
Track bolts, jobbers discount	63-5

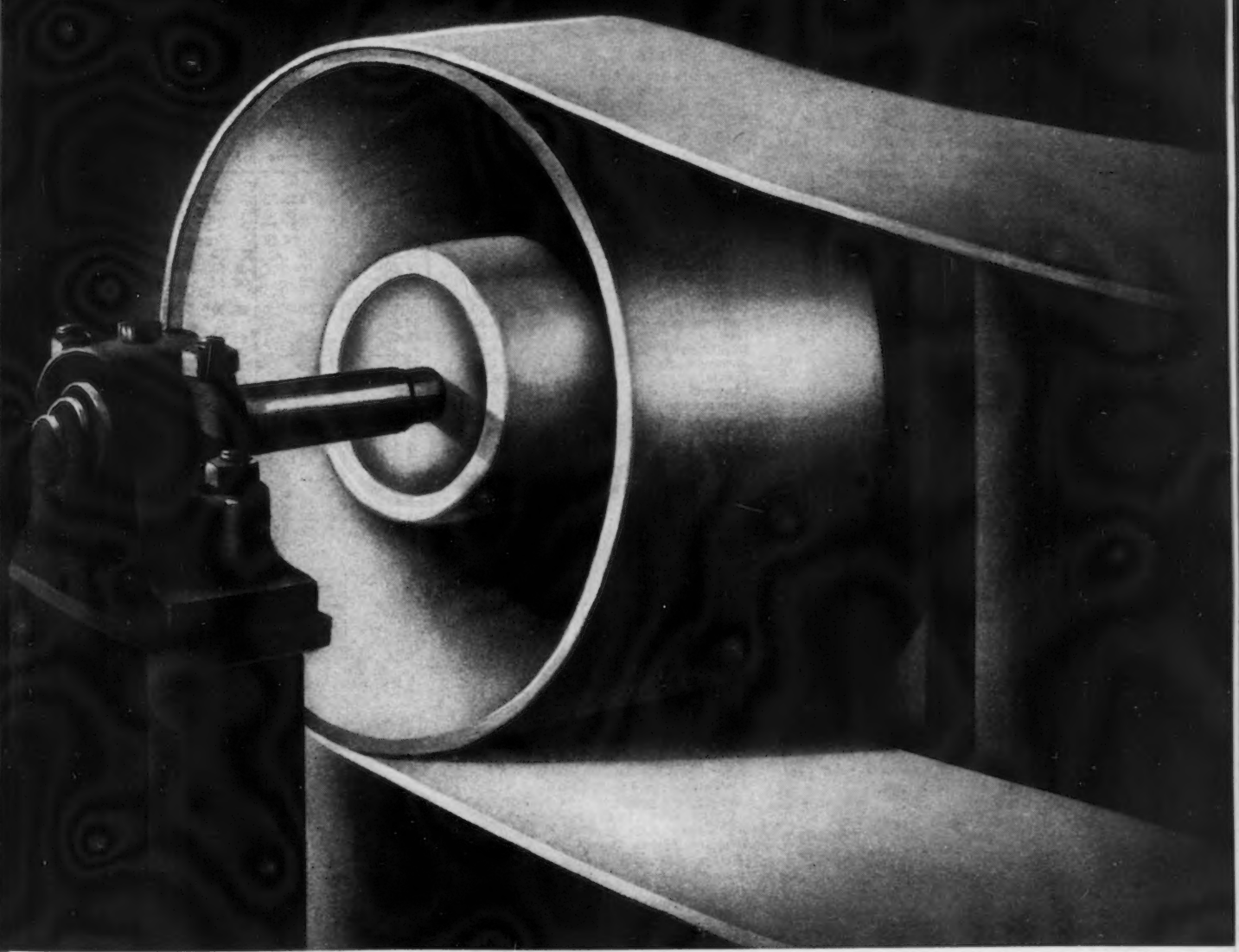
Basing Points, light rails—Pittsburgh, Chicago, Birmingham; spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo; spikes alone—Youngstown, Lebanon, Pa., Richmond.

ROOFING TERNE PLATE

(F.o.b. Pittsburgh, 112 Sheets)

	20x14 in.	20x28 in.
8-lb. coating I.C.	$6.00	$12.00
15-lb. coating I.C.	7.00	14.00
20-lb. coating I.C.	7.50	15.00

Overload–and failure!



Information supplied by an Industrial Publication

Recent tests by a well-known rubber company prove that as little as three pounds extra tension on power transmission belting, above recommended tension, will shorten its life as much as 68 percent!

In the tests three grades of the present wartime construction of transmission belting were used. Each belt was run at 15 pounds per inch per ply, a 720 pound total for the tension, the recommended figure, and at 18 pounds per inch per ply, a total of 864 pounds tension, on 4 inch diameter pulleys. Belts were all 6 inches wide, 30 feet long, spliced in 10 foot endless lengths. Tests were all highly accelerated.

Belt No. 1 ran for 95 hours before breakdown under the 19 pound tension, and increased its life to 230 hours before failure when the tension was 15 pounds.

Belt No. 2 ran for 88 hours at the 18 pound tension, and for 263 hours before failure at 15 pounds.

Belt No. 3 ran for 15 hours under 18 pound tension, and the service life before failure jumped to 48 hours under the 15 pound tension.

Close attention to "details" like this will save costly shut-downs and increase productive man-hours. This is just another case of designing to meet requirements — another important conservation measure.

CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.
MOLYBDIC OXIDE—BRIQUETTED OR CANNED • FERROMOLYBDENUM • "CALCIUM MOLYBDATE"

Climax Molybdenum Company
500 Fifth Avenue • New York City

MOLY

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts:

	Per Cent Off List
½ in. & smaller x 6 in. & shorter	65½
9/16 & ⅝ in. x 6 in. & shorter	63½
¾ to 1 in. x 6 in. & shorter	61
1⅛ in. and larger, all length	59
All diameters over 6 in. long	59
Lag, all sizes	62
Plow bolts	65

Nuts, Cold Punched or Hot Pressed:

(Hexagon or Square)

½ in. and smaller	62
9/16 to 1 in. inclusive	59
1⅛ to 1½ in. inclusive	57
1⅝ in. and larger	56

On above bolts and nuts, excepting plow bolts, additional allowance of 10 per cent for full container quantities. There is an additional 5 per cent allowance for carload shipments.

Semi-Fin. Hexagon Nuts	**U.S.S.**	**S.A.E.**
7/16 in. and smaller	..	64
½ in. and smaller	62	..
⅝ in. through 1 in.	..	60
9/16 to 1 in.	59	..
1⅛ in. through 1½ in.	57	58
1⅝ in. and larger	56	..

In full container lots, 10 per cent additional discount.

Stove Bolts

Packages, nuts loose	71 and 10
In packages, with nuts attached	71
In bulk	80

On stove bolts freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago, New York on lots of 200 lb. or over.

Large Rivets (½ in. and larger)

Base per 100 lb.

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham $3.75

Small Rivets (7/16 in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham ..... 65 and 5

Cap and Set Screws

Per Cent Off List

Upset full fin. hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in.	64
Upset set screws, cup and oval points	71
Milled studs	46
Flat head cap screws, listed sizes	36
Fillister head cap, listed sizes	51

Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

PIG IRON

All prices set in bold face type are maxima established by OPA on June 24, 1941. Other domestic prices (in italics) are delivered quotations per gross ton computed on the basis of the official maxima. Delivered prices do not reflect new 3 per cent tax on freight rates.

	No. 2 Foundry	Basic	Bessemer	Malleable	Low Phos-phorus	Charcoal
Boston††	*$25.53*	*$25.03*	*$26.53*	*$26.03*	.....	.....
Brooklyn	*27.65*	.....	.....	*28.15*	.....	.....
Jersey City	*26.62*	*26.12*	*27.62*	*27.12*	.....	.....
Philadelphia	*25.89*	*25.39*	*26.89*	*26.39*	.....	.....
Bethlehem, Pa.	$25.00	$24.50	$26.00	$25.50	.....	.....
Everett, Mass.††	25.00	24.50	26.00	25.50	.....	.....
Swedeland, Pa.	25.00	24.50	26.00	25.50	.....	.....
Steelton, Pa.	.....	24.50	.....	.....	$29.00	.....
Birdsboro, Pa.	25.00	24.50	26.00	25.50	29.50	.....
Sparrows Point, Md.	25.00	24.50	.....	.....	.....	.....
Erie, Pa.	24.00	23.50	25.00	24.50	.....	.....
Neville Island, Pa.	24.00	23.50	24.50	24.00	.....	.....
Sharpsville, Pa.*	24.00	23.50	24.50	24.00	.....	.....
Buffalo	24.00	23.00	25.00	24.50	29.50	.....
Cincinnati	*24.68*	*24.68*	.....	*25.18*	.....	.....
Canton, Ohio	*25.47*	*24.97*	*25.97*	*25.47*	.....	.....
Mansfield, Ohio	*26.06*	*25.56*	*26.56*	*26.06*	.....	.....
St. Louis	*24.50*	*24.00*	.....	.....	.....	.....
Chicago	24.00	23.50	24.50	24.00	.....	*$31.3*
Granite City, Ill.	24.00	23.50	24.50	24.00	.....	.....
Cleveland	24.00	23.50	24.50	24.00	.....	.....
Hamilton, Ohio	24.00	23.50	.....	24.00	.....	.....
Toledo	24.00	23.50	24.50	24.00	.....	.....
Youngstown*	24.00	23.50	24.50	24.00	.....	.....
Detroit	24.00	23.50	24.50	24.00	.....	.....
Lake Superior fc.	.....	.....	.....	.....	.....	$28.00
Lyles, Tenn. fc.†	.....	.....	.....	.....	.....	33.00
St. Paul	*26.76*	.....	*27.26*	*26.76*	.....	.....
Duluth	24.50	24.00	25.00	24.50	.....	.....
Birmingham	20.38	19.00	25.00	.....	.....	.....
Los Angeles	*27.25*	.....	.....	.....	.....	.....
San Francisco	*27.25*	.....	.....	.....	.....	.....
Seattle	*27.25*	.....	.....	.....	.....	.....
Provo, Utah	22.00	21.50	.....	.....	.....	.....
Montreal	*27.50*	*27.50*	.....	*28.00*	.....	.....
Toronto	*25.50*	*25.50*	.....	*26.00*	.....	.....

GRAY FORGE IRON: Valley or Pittsburgh furnace $23.50

*Pittsburgh Coke & Iron Co. (Sharpsville, Pa., furnace only) and the Struthers Iron and Steel Co., Struthers, Ohio, may charge 50c. a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

**Pittsburgh Ferromanganese Co. (Chester furnace only) may charge $2.25 a ton over maximum basing point prices.

†Price shown is for low-phosphorous iron; high-phosphorous sells for $28.50 at the furnace.

††Eastern Gas & Fuel Associates, Boston, is permitted to sell pig iron produced by its selling company, Mystic Iron Works, Everett, Mass., at $1 per gross ton above maximum prices.

Delta Chemical & Iron Co., Chicago, may charge $30 for charcoal iron at its Delta, Mich., furnace.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50c. a ton for each 0.25 per cent silicon content in excess of base grade which is 1.75 per cent to 2.25 per cent); phosphorous differentials, a reduction of 38c. per ton for phosphorous content of 0.70 per cent and over; manganese differentials, a charge not to exceed 50c. per ton for each 0.50 per cent manganese content in excess of 1.00 per cent. Effective March 3, 1943, $2 per ton extra may be charged for 0.5 to 0.75 per cent nickel content and $1 per ton extra for each additional 0.25 per cent nickel.

WAREHOUSE PRICES

(Delivered Metropolitan areas, per 100 lb. These prices do not necessarily apply for dislocated tonnage shipments when the f.o.b. City prices are used in conformance with OPA Schedule 49)

Cities	SHEETS			STRIP		Plates (¼ in. and heavier)	Structural Shapes	BARS		ALLOY BARS			
	Hot Rolled (10 ga.)	Cold Rolled	Galv. (24 ga.)	Hot Rolled	Cold Rolled			Hot Rolled	Cold Finished	Hot Rolled 2300	Hot Rolled 3100	Cold Drawn 2300	Cold Drawn 3100
Pittsburgh	$3.35	$4.00	$4.75	$3.60	$3.20	$3.40	$3.40	$3.35	$3.65	$7.45	$5.75	$8.40	$6.75
Chicago	3.25	4.10	4.85[1]	3.60	3.50	3.55	3.55	3.50	3.75	7.35	5.65	8.40	6.75
Cleveland	3.35	4.05	4.62	3.50	3.20	3.40	3.58	3.25	3.75	7.55	5.85	8.40	6.75
Philadelphia	3.55	4.63	4.90	3.95	3.31	3.55	3.55	3.85	4.06	7.31	5.86	8.56	7.18
New York	3.58	4.60[2]	5.00	3.96[6]	3.51	3.76	3.75	3.84	4.09	7.60	5.90	8.84	7.19
Detroit	3.43	4.30	4.84[1]	3.43	3.40	3.60	3.65	3.43	3.80	7.67	5.97	8.70	7.05
Buffalo	3.25	4.30[1]	4.75[4]	3.82	3.52	3.62	3.40	3.35	3.75	7.35	5.65	8.40	6.75
Boston	3.71	4.68	5.11	4.06	3.46	3.85	3.85	3.98	4.13	7.77	6.07	8.91	7.26
Birmingham	3.45[3]	.....	4.75[1]	3.70[3]	.....	3.55[3]	3.55[3]	3.50[3]	4.43	.....	.....	.....	.....
St. Louis	3.39	4.24[2]	4.99[1]	3.74	3.61	3.69	3.69	3.64	4.02	7.72	6.02	8.77	7.12
St. Paul	3.50	4.35	5.00	3.85	3.83	3.80	3.80	3.75	4.34	7.45	6.00	8.84	7.44
Milwaukee	3.38	4.23[2]	4.98[1]	3.73	3.54	3.68	3.68	3.63	3.88	7.58	5.88	8.63	6.98
Baltimore	3.50	5.00	5.05	4.00	.....	3.70	3.70	3.85	4.04	.....	.....	.....	.....
Cincinnati	3.42	4.37[2]	4.92[1]	3.67	3.45	3.65	3.68	3.60	4.00	7.69	5.99	8.50	7.10
Norfolk	3.85	4.50	5.40	4.10	....	4.05	4.05	4.00	4.15	....	....	....	....
Washington	3.60	5.10	5.15	4.10	....	3.80	3.80	3.95	4.03	....	....	....	....
Indianapolis	3.45	4.25	5.01[1]	3.75	3.28	3.70	3.70	3.60	3.97	7.67	5.97	8.72	7.07
Omaha	3.85	4.77	5.52[1]	4.20	....	4.15	4.15	4.10	4.42	....	....	....	....
Memphis	3.85	4.66	5.25	4.10	....	3.95	3.95	3.90	4.31	....	....	....	....
New Orleans	3.95	4.95	5.25	4.20	....	3.90	3.90	4.10	4.60	....	....	....	....
Houston	3.75	5.43	5.25	4.30	....	5.25	5.25	3.75	4.50	....	....	....	....
Los Angeles †	4.95	7.15	5.95	4.90	....	4.90	4.60	4.35	5.70	9.55	8.55	10.55	9.55
San Francisco †	4.55	7.55	6.60	4.50	....	4.65	4.35	3.95	5.55	9.80	8.80	10.80	9.80
Seattle †	4.65[7]	6.63	5.70[7]	4.25	....	4.75	4.45	4.20	5.75	....	8.00	....	....

BASE QUANTITIES: Hot rolled sheets, cold rolled sheets, hot rolled strip, plates, shapes and hot rolled bars, 400 to 1999 lb., galvanized sheets, 150 to 1499 lb.; cold rolled strip, extras apply on all quantities; cold finished bars, 1500 lb. and over; SAE bars, 1000 lb. and over. Exceptions: [1] 500 to 1499 lb. [2] 400 to 1499 lb. [3] 400 to 3999 lb. [4] 450 to 1499 lb. [5] 1000 to 1999 lb. [6] 0 to 1999 lb. [7] 300 to 10,000 lb. At Philadelphia galvanized sheets, 25 or more bundles; Boston, cold rolled and galvanized sheets, 450 to 3749 lb.; San Francisco, hot rolled sheets, 400 to 39,999 lb., galvanized and cold rolled sheets, 750 to 4999 lb., cold fin. bars, 0-299 lb.; hot rolled alloy bars, 0-4999 lb.; Seattle, cold finished bars, 1000 lb. and over, hot rolled alloy bars, 0-1999 lb.; Memphis, hot rolled sheets, 400 to 1999 lb., galvanized sheets, 150 and over; St. Paul, galvanized and cold rolled sheets, any quantity, hot rolled bars, plates, shapes, hot rolled sheets, 400 to 14,999 lb.; Los Angeles, hot rolled sheets, bars, plates, cold rolled sheets, 300 to 1999 lb.; galvanized sheets, 1 to 6 bundles; cold finished bars, 1 to 99 lbs.; SAE bars, 100 lb. Extras for size, quality, etc., apply on above quotations.

† Los Angeles, San Francisco and Seattle prices reflect special provisions of amendment No. 2 to OPA Price Schedule No. 49.